DPF 2009

Report of Contributions

https://indico.cern.ch/e/41044

Contribution ID: **2** Type: **not specified**

Icosahedral (A_5) Family Symmetry and the Golden Ratio Prediction for Solar Neutrino Mixing

Tuesday 28 July 2009 15:00 (15 minutes)

I investigate the possibility of using icosahedral symmetry as a family symmetry group in the lepton sector, focusing on the intriguing hypothesis that the solar neutrino mixing angle is governed by the golden ratio. I will present a basic toolbox for model-building using icosahedral symmetry, including explicit representation matrices and tensor product rules. As a simple application, I will construct a minimal model at tree level in which the solar angle is related to the golden ratio, the atmospheric angle is maximal, and the reactor angle vanishes to leading order.

Author: Mr STUART, Alexander (University of Wisconsin-Madison)

Presenter: Mr STUART, Alexander (University of Wisconsin-Madison)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **3** Type: **not specified**

Magnetic Moment of Neutrino in Hot and Dense Medium

Thursday 30 July 2009 15:00 (15 minutes)

A massive neutrino can couple with the external magnetic field through its mass. A massive neutrino has a very tiny magnetic moment and is extremely insignificant for astrophysics and cosmology. However, the finite temperature and density effects of the background increase the magnetic moment of neutrino to a desired value. We compare the background effect on the magnetic moment of neutrino through Dirac and Majorana type mass. Some of the applications of the magnetic moment are also discussed.

Author: MASOOD, Samina (Univ. of Houston Clear Lake)

Presenter: MASOOD, Samina (Univ. of Houston Clear Lake)

Session Classification: Neutrino Physics III

Track Classification: Neutrino Physics

Contribution ID: **4** Type: **not specified**

LHC signals of a Supersymmetry scenario with right chiral neutrinos

Tuesday 28 July 2009 15:20 (20 minutes)

If neutrinos are Dirac type, in supersymmetry (SUSY), their masses can be explained by the introduction of an additional right chiral (neutrino) superfield which interacts with other superparticles through a tiny neutrino Yukawa coupling. We found that superpartner of such a right chiral neutrino (sneutrino) can be lightest among all the superparticles in a wide range of SUSY parameter space and hence can replace the lightest
neutralino dark matter candidate in those regions.

Collider signatures of such a SUSY scenario are especially interesting provided the next to lightest superparticle (NLSP) is charged and hence long lived because of smallness of neutrino Yukawa coupling.

We discuss LHC signatures of such a SUSY scenario of sneutrino dark matter with two specific charged NLSPs as
(a) lighter stau, and (b) lighter stop and show that they can be easily distinguished from the standard model background. We will also discuss gluino reconstruction in case of stop NLSP.

Author: Dr GUPTA, Sudhir (Iowa State University)

Presenter: Dr GUPTA, Sudhir (Iowa State University)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **5** Type: **not specified**

EXO-200

Friday 31 July 2009 14:30 (15 minutes)

EXO-200 is the first phase of the Enriched Xenon Observatory (EXO) experiment, which searches for neutrinoless double beta decay in Xe-136 to measure the mass and probe the Majorana nature of the neutrino. EXO-200 consists of 200 kg of liquid Xe enriched to 80% in Xe-136 in an ultra-low background TPC. Energy resolution is enhanced through the simultaneous collection of scintillation light (using Large Area Avalanche Photodiodes (LAAPD's) and ionization charge. It is being installed at the WIPP site in New Mexico, which provides a 2000 meter water-equivalent overburden. EXO-200 will begin taking data in 2009, with the expected two-year sensitivity to the half-life for neutrinoless double beta decay of 6.4 x 10ˆ25 years. According to the most recent nuclear matrix element calculations, this corresponds to an effective Majorana neutrino mass of 0.13 to 0.19 eV. It will also measure the two neutrino mode for the first time in Xenon 136.

Author: ACKERMAN, Nicole (SLAC)

Presenter: ACKERMAN, Nicole (SLAC)

Session Classification: Neutrino Physics IV

Track Classification: Neutrino Physics

Contribution ID: **6** Type: **not specified**

Matter-Antimatter Interaction at Low Energies: Formation of Exotic Heteromolecules

The successful operation of the LHC facilities at CERN and the production of unlimited number of particles and antiparticles at high energies raise the challenging question about the possible cooling of these particles and the enhancement of matter-antimatter physics. Particularly, of great interest is the realization of research channels similar to the "ALPHA" and "ATRAP' experiments. In these cases the trapping of large number of cold antiprotons led, respectively, to the formation and trapping of antihydrogens as well as the production of protoniums. In other words it is anticipated that investigations could be extended to the formation of different quasi atoms containing leptons and hadrons. The main goal of the present work is to explore the possible formations of heterocompounds, i.e. exotic molecular structures composed of particles and antiparticles, e.g. e- p+ p- e+, e- π+ π- e+, e- μ+ μ- e+ and μ- π+ π- μ+. Special attention is devoted to the first member of these compounds, namely the heterohydrogens and their isotopes (Antihydrogen-Hydrogen, Antihydrogen-Deuterium and Antihydrogen-Tritium). However, it is indicated that the other compounds are bound and could be formed in nature.

Summary

Possible coexistence of matter and antimatter at low energies is explored as one of the fruitful implementations of the LHC project.

Author: ABDEL-RAOUF, Mohamed Assad (United Arab Emirates Un iversity, College of Science)

Presenter: ABDEL-RAOUF, Mohamed Assad (United Arab Emirates Un iversity, College of Science)

Track Classification: Poster Session

Contribution ID: **7** Type: **not specified**

Novel Multi-pixel Silicon Photon Detectors and Applications in T2K.

Thursday 30 July 2009 17:30 (25 minutes)

T2K is Tokai to Kamioka long baseline neutrino oscillation experiment (Japan). The goal of the experiment is to measure theta13 neutrino oscillation parameter by nu-e appearance from nu-mu beam. The near off-axis detector, ND280, consists of several sub-detectors in 0.2T magnetic field, with photon readout scheme. This necessitates usage of the efficient, high performance photon detector that can operate in the magnetic field.
For about last ten years, a new generation of the Multi-pixel silicon photo detectors in limited Geiger mode have been available to researchers. They surpass previous generations of silicon photo detectors by featuring high amplification, easy photo-electron calibration, magnetic field non-susceptibility and relatively low cost. This talk will cover general characteristics, operational principle and the large scale deployment of one particular model of these newly available photo detectors.

Author: BEZNOSKO, Dmitriy (NN Group SUNYSB)

Presenter: BEZNOSKO, Dmitriy (NN Group SUNYSB)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **8** Type: **not specified**

Hints for the scale of new CP-violating physics from B-CP anomalies

Monday 27 July 2009 15:10 (20 minutes)

We consider several hints for new physics involving CP-asymmetries in B-decays and interpret them in terms of generic contributions to effective Wilson coefficients. The effects we focus on are: the differences in the fitted value of sin(2 beta) versus the ones directly measured via the time dependent CP asymmetries in B -> J/psi K or via B -> (phi,eta') K; the difference between the direct CP asymmetries in B- -> K- pi0 and B0 -> K- pi+ and the ˜2.2 sigma indications for the CP-asymmetry in Bs -> J/psi phi. To alleviate concerns regarding the disagreement between inclusive and exclusive Vub, we show that our results hold even without the inclusion of Vub in the analysis. We find that no matter what kind of new physics (NP) is invoked to explain these effects, its effective scale is bounded from above from a few hundred GeV to a few TeV depending on specific assumptions regarding the type of new physics. The only exception to this is when the NP contribution is assumed to reside entirely in LR operators in K mixing, then the scale of NP can be as high as around 24 TeV; however, this case cannot account for CP asymmetry in Bs -> J/psi phi or a difference in sin(2 beta) from penguin modes compared to that from J/psi K or for that matter the large difference seen between direct CP asymmetries in K- pi+ and in K- pi0.

Author: Dr LUNGHI, Enrico (Indiana University)

Co-author: Dr SONI, Amarjit (BNL)

Presenter: Dr LUNGHI, Enrico (Indiana University)

Session Classification: CP-violation I

Track Classification: CP-violation

Contribution ID: **9** Type: **not specified**

|Upsilon(1S)–>\Gamma(\eta',\eta,f_2(1270)) decays

Monday 27 July 2009 14:00 (20 minutes)

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\begin{document}
\title{$\Upsilon(1S) \to \gamma(\eta', \eta, f_2(1270))$ decays }
\author{Bing An Li\\Department of Physics, Univ. of Kentucky, Lexington, USA}
%KY, 40506, USA}
\maketitle
In this talk the study of $\Upsilon(1S) \to \gamma(\eta', \eta, f_2(1270))$ decays
is presented.

Comparing with decays $J/\psi \to \gamma(\eta', \eta, f_2(1270))$,
very small upper limits
\[B(\Upsilon(1s)\rightarrow\gamma\eta)<1.0\times10^{-6},\;\;
B(\Upsilon(1s)\rightarrow\gamma\eta')<1.9\times10^{-6}\]
and larger
\[B(\Upsilon(1S)\rightarrow\gamma f_2(1270))=(10.2\pm0.8\pm0.7)\times 10^{-5},\]
%\[B(\Upsilon(1S)\rightarrow\gamma f_2(1270))=(10.5\pm1.6(stat)^{+1.9}_{-1.8}(syst))\times 10^{-5}\]
have been reported by CLEO.
Dependence on quark mass plays key roles in these decays of $J/\psi, \Upsilon(1S)$. An approach
in which η' and $f_2(1270)$ are strongly coupled to gluons has been used to study these decays.
This approach has successfully predicted
\[\frac{\Gamma(J/\psi\rightarrow\gamma\eta')}{\Gamma(J/\psi\rightarrow\gamma\eta)}=5.1\]
and very small \(y=T_2/T_0\)($J/\psi \to \gamma f_2$) which agrees with data well.
By using this approach very strong quark mass dependence
\[\frac{B(\Upsilon\rightarrow\gamma\eta')}{B(J/\psi\rightarrow\gamma\eta')}=
0.29\frac{\alpha_s(m_c)}{\alpha_s(m_b)}({m_c\over m_b})^7\]
is obtained. Inputting $B(J/\psi \to \gamma\eta')$,
\[B(\Upsilon\rightarrow\gamma\eta')=1.04\times10^{-7},\;\;B(\Upsilon\rightarrow\gamma\eta)=0.23\times10^{-8}\]
are obtained. They are in good agreement with data. The study shows that
d-wave dominance in $\Upsilon(1S) \to \gamma f_2(1270)$ is the consequence of the strong coupling
between f_2 and gluons and an enhancement factor, $\frac{p_\Upsilon^4}{p_f^4}$, in the ratio of the decay rates is resulted
in the d-wave dominance. Like $\Upsilon(1s) \to \gamma\eta'$ there is suppress factor by m_b in
$\Upsilon(1S) \to \gamma f_2(1270)$. The combination of these two factors lead to larger
$B(\Upsilon(1S) \to \gamma f_2(1270))$. On the other hand, very small ratios of the helicity amplitudes
are predicted and they agree with data.

Right quark mass dependencies of $\Upsilon(1s) \to \gamma(\eta', \eta, f_2(1270))$ are revealed from the
couplings between the mesons and gluons. Theoretical results agree with data well. In this study
\(m_c=1.3GeV\) and
$\bar{MS}$
mass of b-quark are taken.
\end{document}

Author: LI, Bing An (University of Kentucky)

Presenter: LI, Bing An (University of Kentucky)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **10** Type: **not specified**

New limit of pion form factor at very large Q^2

Friday 31 July 2009 14:00 (25 minutes)

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\begin{document}
\title{New limit of Pion Form Factor at very Large Q^2 }
\author{Bing An Li, Department of Physics, Univ. of Kentucky, Lexington,USA}

\maketitle
In this talk a new F_π at $Q^2 \to \infty$ is presented.
Pion form factor is a very important quantity in hadron physics, it is
defined by following matrix element
\[<\pi^+|j_\mu(0)|\pi^+>=\int d^4 k_2\int d^4 k_1 Tr\{\phi_\pi(k_1,p_f)T_H(k_1,k_2,p_f,p_i)*mu*
phi\pi(k_2,p_i)\}=F_\pi(Q^2)P_\mu.\]
Perturbative QCD predicts that one gluon exchange dominates T_H at large Q^2.
The wave function ϕ_π is from nonperturbative QCD.
\[F_\pi(Q^2)|*{Q^2*rightarrow*infty}=4*pi*alpha_s(Q^2)f^2*\pi/Q^2\]
is most quoted, where f_π^2 is a quantity from nonperturbative QCD at low energies.
However, there are other
different F_π at $Q^2 \to \infty$, which are obtained by different
distribution amplitudes.
The Q^2 of current experiments is too low for testing these results.
A chiral theory of pseudoscalar, vector, and axial-vector mesons has been applied to study pion physics
at energy lower than 2 GeV. Theoretical results agree with data very well. Besides the ρ-pole pion form factor there is
a new intrinsic form factor which obtained from this chiral theory. The ρ-pole form factor of pion has
shortcomings: in space-like region it decreases too slow and in time-like region it decreases
too fast. The intrinsic form factor redeems these two problems. Theory agrees with data very well
There is no new adjustable parameter in the new pion form factor.

The wave function of pion is obtained from this chiral theory, which successfully describes the pion physics at lower energies. In this study the kernel T_H is determined by perturbative QCD and the wave
function of pion is obtained from the chiral theory.
The pion form factor at $Q^2 >> (1.8GeV)^2$ is obtained
\[F_\pi(Q^2)=4\pi\alpha_s(Q^2)f^2_\pi{1\over Q^2}{1\over18}(1-{2c\over g})^{-2}\{{2c^2\over g^2}
+(1-{c\over g})(1-{4c\over g})-{1\over 4\pi^2 g^2}(1-{c\over g})(1-{2c\over g})\}.\]
The numerical result is
\[F_\pi(Q^2)=2.65\times10^{-2}4\pi\alpha_s(Q^2)f^2_\pi{1\over Q^2}.\]
It is interesting to mention that at high Q^2 the ρ-pole with one gluon exchange behaves
like $\frac{1}{Q^4}$. Therefore, at high Q^2 the contribution of ρ-pole can be ignored.

\end{document}

Author: LI, Bing An (University of Kentucky)

Presenter: LI, Bing An (University of Kentucky)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **11** Type: **not specified**

New dynamical gauges of the SM of EW interactions

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\begin{document}
\title{New dynamical gauges of the SM of EW interactions }
\author{Bing An Li\\Department of Physics, Univ. of Kentucky, Lexington, USA}
\maketitle
In this talk it shows that new gauge fixings of the SM of EW interactions are **dynamically** generated from the
theory itself, which can be tested by LHC experiments. A new mechanism of chiral symmetry breaking, inspired
by Weinberg's second sum rule, \(mˆ2_a=2mˆ2_\rho\), is proposed.
This new mechanism is found from a chiral field theory of pseudoscalar, vector, and axial-vector mesons,
in which mesons are coupled to quarks. Quarks have dynamical quark mass.
The vacuum polarization of the a_1 field which is coupled to axial-vector current of massive quark is expressed as
\[\Pi_{\mu\nu}ˆ{ij}(qˆ2)=\delta_{ij}\{F_1(qˆ2)(q_\mu q_\nu-qˆ2 g_{\mu\nu})+F_2(qˆ2)q_\mu q_\nu+{1\over2}\Delta mˆ2 g_{\mu\nu}\}.\]
Therefore, both the gauge fixing term(F_2) and the mass term of a_1 field are dynamically generated from
dynamical quark mass. These two terms lead to
\[(1-{1\over 2\piˆ2 gˆ2})mˆ2_a=2mˆ2_\rho,\]
where g is a universal constant of the theory. This formula fits data better.
The two new terms are treated **nonperturbatively**.
Comparing with QCD and QED, theory of EW interactions have both axial-vector currents and charged
vector currents of massive fermions. The vacuum polarizations of Z-filed and W-field have both gauge fixing and mass terms.
They are dynamically generated from fermion masses and they should be treated nonperturbatively.
In this talk only the gauge fixing terms dynamically generated from fermion masses are discussed.
The propergators of Z- and W- fields are derived as
\[\Delta_{\mu\nu}ˆZ=
\frac{1}{qˆ2-mˆ2_Z}\{-g_{\mu\nu}+(1+\frac{1}{2\xi_Z})\frac{q_\mu q_\nu}{
qˆ2-mˆ2_{\phiˆ0}}\}\]
where \(m_{\phiˆ0}=m_t eˆ{\frac{mˆ2_z}{mˆ2_t}{16\piˆ2\over3\bar{g}ˆ2}+1}
=3.78\times10ˆ{14}GeV,\;\;\;
\xi_Z=-\frac{mˆ2_Z}{2mˆ2_{\phiˆ0}}=-1.18\times10ˆ{-25}\).
\[\DeltaˆW_{\mu\nu}=

\frac{1}{q^2-m^2_W}\{-g_{\mu\nu}+(1+\frac{1}{2\xi_W})\frac{q_\mu q_\nu}{
q^2-m^2_{\phi_W}}\}\]
where \(m_{\phi_W}=m_t e^{{16\pi^2\over3g^2}{m^2_W\over m^2_t}}
=9.31\times10^{13}GeV,\;\;\;
\xi_W=-{m^2_W\over2m^2_{\phi_W}}=-3.73\times10^{-25}\).
Top quark plays dominant role in the determination of these propagators.
These results are independent of spontaneously chiral symmetry breaking. The effects of these propergators
can be found in loop diagrams and can be tested by LHC experiments.
\end{document}

Author: LI, Bing An (University of Kentucky)

Presenter: LI, Bing An (University of Kentucky)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **12** Type: **not specified**

Presymmetry beyond the Standard Model

Friday 31 July 2009 17:30 (20 minutes)

We go beyond the Standard Model guided by presymmetry, the discrete electroweak quark-lepton symmetry hidden by topological effects which explain quark fractional charges as in condense matter physics. Partners of the particles of the Standard Model and the discrete symmetry associated with this partnership appear as manifestations of a residual presymmetry and its extension from matter to forces. This duplication of the spectrum of the Standard Model keeps spin and comes nondegenerated about the TeV scale. [Work supported by the Departamento de Investigaciones Cientificas y Tecnologicas, Universidad de Santiago de Chile, Usach.]

Summary

In this short talk, the quark-lepton charge relations which have motivated the research are presented. The hypotheses of electroweak quark-lepton symmetry and weak topological-charge confinement that account for the observed symmetry are stated. The approach, which adds to the Standard Model the new hidden states of prequarks and preleptons and the associated presymmetry, is described. In particular, the problem of gauge anomaly is addressed. Motivations to go beyond the Standard Model by duplicating in a symmetric way the particle spectrum are next given. The prime motivation is to generate a residual presymmetry in the sense of Ekstein, so avoiding the use against the model of the Occam's razor principle. In fact, presymmetry is difficult to test or refute at the level of the Standard Model. Constraints from high precision experiments provide only restrictions on the mass of the new particles. The upper bounds below 1 TeV for fermions partners raise expectations of their direct detection. The talk ends with conclusions based on results. [Refs.: E.A. Matute, Mod. Phys. Lett. A (2009), to be published; Int. J. Mod. Phys. A22, 3669 (2007); Phys. Rev. D73, 055008 (2006).]

Author: Prof. MATUTE, Ernesto (Universidad de Santiago de Chile)

Presenter: Prof. MATUTE, Ernesto (Universidad de Santiago de Chile)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **13** Type: **not specified**

The Dark Energy Survey

Monday 27 July 2009 16:30 (25 minutes)

The discovery that the universe is accelerating, not slowing down from the mass it contains, is the surprise that sets the initial research program of 21st Century cosmology. The Dark Energy Survey is a next generation sky survey aimed directly at understanding this mystery. We will build an extremely red sensitive 500 Megapixel camera, a 1 meter diameter, 2.2 degree field of view prime focus corrector, and a data acquisition system fast enough to take images in 17 seconds. The cage containing the system mounts at the prime focus of the Blanco 4-meter telescope at CTIO, a southern hemisphere NOAO telescope.
Over 5 years we will use 30% of the available time on the telescope to pursue a high precision multi-bandpass wide area survey, designed to produce photometric redshifts from 0.2 < z < 1.3. The survey g,r,i,z data will cover 5000 sq-degrees, with 4000 sq-degrees overlapping the Sunyaev-Zeldovich CMB survey being conducted by the South Pole Telescope.
Our 4 science goals aim at extracting cosmological information on the dark energy from 1) cluster counting and spatial distribution of clusters at 0.1 < z < 1.3, 2) the shifting of the galaxy spatial angular power spectra with redshift, 3) weak lensing measurements on several redshift shells to z˜1, and 4) 2000 supernovae at 0.3 < z < 0.8.
The signature of dark energy being a cosmological constant is that the dark energy density remains constant while the universe expands; technically that w=-1 and that dw/dt = 0. We aim at a 5%-15% precision measurement in w from each of our experiments, and a 30% measurement in w'. Combined, they provide both stronger constraints and a check on systematic errors.
We review the science goals and the status of the survey.

Author: Prof. HONSCHEID, Klaus (Ohio State University)

Presenter: Prof. HONSCHEID, Klaus (Ohio State University)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **14** Type: **not specified**

The Dark Energy Camera - a New Instrument for the Dark Energy Survey

Friday 31 July 2009 14:00 (25 minutes)

The discovery that the universe is accelerating, not slowing down from the mass it contains, is the surprise that sets the initial research program of 21st Century cosmology. The Dark Energy Survey (DES) is a next generation sky survey aimed directly at understanding this mystery. DES is designed to measure the dark energy equation of state parameter with four complementary techniques: galaxy cluster counts, weak lensing, angular power spectrum and type Ia supernovae. We present an overview of the DES instrument (DECam) which will be mounted at the prime focus of the Blanco 4m telescope at CTIO. DECam includes a 3 square degree focal plane covered by 62 2kx4k CCDs, a five element optical corrector, up to eight filters, a modern readout and control system, and the associated infrastructure for operation in a new prime focus cage. We will use the 250 micron thick fully-depleted CCDs developed at Lawrence Berkeley National Laboratory (LBNL). DECam also includes design features to enhance the image quality and the efficiency of operations. DECam will be devoted to the DES for 30% of the time over five years and will otherwise be available to the community as an NOAO facility instrument. We will review the status of the construction of the instrument highlighting the results of this summer's full scale integration tests.

Author: Prof. HONSCHEID, Klaus (Ohio State University)

Presenter: Prof. HONSCHEID, Klaus (Ohio State University)

Session Classification: Detectors II

Track Classification: Detector Technology and R&D

Contribution ID: **15** Type: **not specified**

ATLAS Pixel Radiation Monitoring with HVPP4 System

Thursday 30 July 2009 14:50 (25 minutes)

We will describe the principles of radiation damage monitoring using the current measurements of the pixel sensors to be provided by the circuits of ATLAS Pixel Detector HVPP4 System. The dependence of the leakage current with respect to an integrated luminosity at several temperature scenarios will be presented. Based on the analysis we have evaluated the sensitivity specifications for a Current Measurement System under development at University of New Mexico, USA and CERN. The status of the development will be reported as well.

Summary

Report on the development of ATLAS Pixel Detector current monitoring system for the pixel sensors.

Authors: GORELOV, Igor (Department of Physics and Astronomy, Univ. of New Mexico, USA); HOEFERKAMP, Martin (Department of Physics and Astronomy, Univ. of New Mexico, USA)

Co-authors: TOMS, Konstantin (Department of Physics and Astronomy, Univ. of New Mexico, USA); SEIDEL, Sally (Department of Physics and Astronomy, Univ. of New Mexico, USA)

Presenter: GORELOV, Igor (Department of Physics and Astronomy, Univ. of New Mexico, USA)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **16** Type: **not specified**

Results from the Commissioning of the ATLAS Pixel Detector with Cosmic data.

Tuesday 28 July 2009 14:25 (25 minutes)

The ATLAS Pixel Detector is the innermost detector of the ATLAS experiment at the Large Hadron Collider at CERN. Approximately 80M electronic channels of the detector, made of silicon, allow detecting particle tracks and secondary vertices with very high precision.
After connection of all of the cooling components and services, and verification of their operation the ATLAS Pixel Detector is now in the final stage of its commissioning phase. Prior to the first beams expected in Summer 2009, a full characterization of the detector is being performed. Calibration of optical connections, verification of the analog performance and special DAQ runs for noise studies are being carried out. Combined operation of ATLAS Pixel system with other sub-detectors in ATLAS allows for qualification of the detector with physics data from cosmic muons. The presentation will cover all of the aspects of detector operation, including the monitoring and safety system, the DAQ system and calibration procedures. The summary of calibration tests on the whole detector as well as the analysis of physics runs with cosmic data will be presented.

Summary

The ATLAS Pixel Detector [1] was connected to the electrical and cooling services and off-detector readout electronics in March 2008. All connections were certified before the detector was closed. Prior to the operation with the Large Hadron Collider (LHC) beam, all the necessary tuning procedures for the pixel detector have been performed, and the detector itself has been fully qualified. The detector has been successfully integrated into ATLAS Trigger and DAQ system, allowing for high efficiency in data recording, synchronously with other sub-detectors.
The detector functionality checks have been performed starting from the early production phase. For this purpose, dedicated calibration techniques have been implemented [2]. These techniques have been developed in each detector assembly stage, matching the demands for the real detector services and for the readout system. Additional calibration procedure, related to the operation within ATLAS, have been introduced. The characterization aims for stable operation of the detector and provides input for the offline analysis to guarantee high quality of the reconstructed data. Important detector characterization issues are:

- tuning of optical links - to have reliable connections between the detector and readout electronics and to adjust fine detector timing;
- threshold tuning - to have a uniform predefined threshold for all detector channels;
- ToT 1 tuning - to have a uniform detector response upon detection of the same deposited charge for all detector channels ;
- bump connectivity check - to check for unconnected channels;
- ToT calibration - to calibrate detector response to the input charge;
- noise occupancy check - to verify low-noise performance and spot noisy channels;
- timewalk check - to study timing behavior of detector channels;
- sensor check - to study charge collection efficiency and detector leakage current.

Previous experience with detector characterization so far has been limited to parts of the detector. For combined operation with test beam, only a few modules were used, whereas just one whole endcap (10% of the detector) was tested as a stand-alone setup under real operating conditions with cosmic muons [3]. In contrast, the results shown in this presentation give a summary of qualification tests for the whole detector in situ.
In addition to the above, the analysis of special data-taking runs with pseudo-random triggers to verify noise occupancy, as well as the outcome of combined runs with cosmic muons will be presented.

References

[1] G. Aad et al., ATLAS Pixel Detector Electronics and Sensors, to be published in Journal of Instrumentation, 2008
[2] ATLAS Pixel Collaboration, ATLAS Pixel Module Electrical Test Description, ATL-IP-QP-0144, 2004
[3] ATLAS Pixel Collaboration, Pixel Offline Analysis of Endcap A Cosmic Data, ATL-INDET-PUB-2008-003

Author: Dr EVGENY, Galyaev (University of Texas at Dallas)

Presenter: Dr EVGENY, Galyaev (University of Texas at Dallas)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **18** Type: **not specified**

Rotational and Vibrational As Well as Linear Kinetic Energies Should Be Included in Compton Effect Calculations

The incident photon in Compton scattering may also affect the rotation and vibration of the impacted particle. Therefore, the Compton Effect formula must account for the total motion change, not just the linear motion. The Compton relation must be modified in the following manner: $\{hc/\lambda_1 + mc^2 + 1/2mv_1^2 + 1/2I\omega_1^2 + 1/2k_1x_1^2 = hc/\lambda_2 + mc^2 + 1/2mv_2^2 + 1/2I\omega_2^2 + 1/2k_2x_2^2\$$.

Author: BREKKE, Stewart (Northeastern Illinois University)

Presenter: BREKKE, Stewart (Northeastern Illinois University)

Track Classification: Accelerator Physics

Contribution ID: **20** Type: **not specified**

Higher-order corrections to top-antitop pair and single top quark production

Tuesday 28 July 2009 16:30 (15 minutes)

I present the latest results on the theoretical cross section for top-antitop pair production as well as for single top production at the Tevatron and the LHC. The calculations include higher-order soft-gluon corrections which are dominant near threshold. The top quark transverse momentum distribution is also presented.

Author: Prof. KIDONAKIS, Nikolaos (Kennesaw State University)

Presenter: Prof. KIDONAKIS, Nikolaos (Kennesaw State University)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **21** Type: **not specified**

Two-loop soft anomalous dimensions with massive and massless quarks

Thursday 30 July 2009 15:10 (25 minutes)

I present results for two-loop soft anomalous dimensions, which are derived from dimensionally regularized diagrams with eikonal quark lines and control soft-gluon emission in hard-scattering processes. Detailed results for the UV poles of the eikonal integrals will be shown for massive quarks, and the massless limit will also be taken. The construction of soft anomalous dimensions at two-loops allows soft-gluon resummations at NNLL accuracy.

Author: Prof. KIDONAKIS, Nikolaos (Kennesaw State University)

Presenter: Prof. KIDONAKIS, Nikolaos (Kennesaw State University)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **22** Type: **not specified**

PETAVAC: 100 TeV PROTON-ANTIPROTON COLLIDER IN SSC TUNNEL

Tuesday 28 July 2009 17:00 (30 minutes)

Recent developments in accelerator physics and super-conducting magnet technology make it reasonable to extend proton-antiproton colliding beams from the 2 TeV of the Tevatron to 100 TeV in the existing SSC tunnel, with luminosity ˜10ˆ35 /cm2s. At 100 TeV boson-boson fusion becomes a significant initial state for production of new massive particles. Petavac would extend the mass reach beyond LHC by the same factor that LHC extends beyond Tevatron. The major parameters and design issues will be discussed.

Summary

The antiproton source and collider scenarios at the Tevatron yield accumulation of >2 x 1011 /hr, cooling and stacking of >2 x 1012 in 10 hr. Control of emittance growth mechanisms yields collisions with luminosity >2 x 1032 cm-2s-1 in each store and luminosity lifetime >10 hr. Nb3Sn dipole development has yielded field strength >16 T, and 4-m-long coils using this technology have been tested successfully. We present a conceptual for a 100 TeV collider in which a single 16 T magnet ring is located in the SSC tunnel, and discuss issues from synchrotron radiation, electron cloud effect, and beam separation.
Here we examine the case for a collider of 100 TeV energy and 1035 cm-2s-1 luminosity: the technology for a 16.5 T magnet ring, control of synchrotron light emitted by the beams, the elimination of subsidiary bunch cross-ings, the luminosity scaled from Tevatron performance, the SSC tunnel in Waxahatchie, and the physics potential of hadron collisions at 100 TeV.

Author: Prof. MCINTYRE, Peter (Texas A&M University)

Co-author: Dr SATTAROV, Akhdiyor (Texas A&M University)

Presenter: Prof. MCINTYRE, Peter (Texas A&M University)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **23** Type: **not specified**

Motion Creation in Elementary Particle Creation and Its Continuance: A Natural Law

All masses are in a state of no motion, linear, rotational and vibratory motion.
Therefore, when an elementary particle is created, the energy involved in the creation, besides creating the mass, may also create a linear, rotational and/or vibratory motion of the particle singly or in some combination. and the magnitude of these various motions of the created particle may be modified throughout the lifetime of the particle due to external forces. The basic energy equation for this law of nature is as follows. \$E = mc^2 + 1/2mv^2 + 1/2I\omega_r^2 + 1/2kx_0^2\$. \$I\omega_r^2\$ is the kinetic energy of a rotating sphere and \$kx_0^2\$ is the energy of a simple harmonic oscillator. The rotation and oscillaton factor may vary due to type of shape of the particle
and type of oscillation.

Author: Mr BREKKE, Stewart (Northeastern Illinois University)

Presenter: Mr BREKKE, Stewart (Northeastern Illinois University)

Track Classification: Accelerator Physics

Contribution ID: **24** Type: **not specified**

Web 2.0 for Particle Physicists

Tuesday 28 July 2009 14:20 (20 minutes)

Emerging forms of social media such as Facebook, Twitter and YouTube have become primary ways for many members of all generations to stay connected and find out about what is going on in the world around them. Particle physics communicators have begun to exploit social media to connect with their audiences.

Scientists from around the world contribute to Quantum Diaries, a collection of blogs by particle physicists organized by the InterAction collaboration. Fermilab and SLAC use Facebook to communicate with readers of their joint publication, symmetry magazine, and its associated blog. Argonne National Laboratory frequently updates its Twitter feed with press releases and links to related articles. Lawrence Berkeley Laboratory regularly adds to its YouTube channel and has created a video glossary on its Web site.

Social media present many opportunities for effective communication for particle physicists.

Author: GRIM, Kathryn (Fermi National Accelerator Laboratory)

Presenter: GRIM, Kathryn (Fermi National Accelerator Laboratory)

Session Classification: Education and Outreach in HEP

Track Classification: Education and Outreach in HEP

Contribution ID: **25** Type: **not specified**

Electroweak Radiative Corrections to Neutrino-Neucleon Scattering at NuTeV

Friday 31 July 2009 14:00 (20 minutes)

The W boson mass extracted by the NuTeV collaboration from the ratios of neutral and charged-current neutrino and anti-neutrino cross sections differs from direct measurements performed at LEP2 and the Fermilab Tevatron by about 3σ. Several possible sources for the observed difference have been discussed in the literature, including new physics beyond the Standard Model (SM). However, in order to be able to pin down the cause of this discrepancy and to interpret this result as a deviation to the SM, it is important to include the complete electroweak one-loop corrections when extracting the W boson mass from neutrino scattering cross sections. We will present results of a Monte Carlo program for νN ($\bar{\nu}N$) scattering in both massless and massive calculations including the complete electroweak $calO(\alpha)$ corrections, which will be used to study the effects of these corrections on the extracted values for the electroweak parameters. We included also in our calculation the full fermion-mass dependence, which has not been studied before. We found that using the calculation with fermion-mass dependence shifts the W boson mass.

Author: Dr PARK, kwangwoo (southern methodist university)

Presenter: Dr PARK, kwangwoo (southern methodist university)

Session Classification: Electroweak Physics III

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **26** Type: **not specified**

HINTS FOR NEW PHYSICS IN B-CP ASYMMETRIES: MAY BE WE ARE EIGHT NOW?

Monday 27 July 2009 15:30 (20 minutes)

"B-CP anomalies, "4th"generation and the LHC

Abstract Although the CKM-paradigm works approximately to O(20%), there are by now several indications that suggest the need for beyond the Standard Model CP-odd phase(s). The value of sin 2β measured via the goldplated (tree) mode, B ⟶ ψK s is smaller than the value deduced by using improved lattice matrix elements. The value of sin 2β measured via 'penguin-dominated' (loop) decays tends to be even smaller still. There is also a rather large difference between the direct CP asymmetries in ⟶ K − π + and B − ⟶ K − π 0 that is rather difficult to understand. Also recently, CDF and D0 are finding about a signal of CP asymmetry B s ⟶ ψϕ. If true, this would be consistent with the indications of new CP-phase in penguin b ⟶ s transitions seen at B-factories. We emphasize that the data are quite suggestive of a fourth family with m_ t' in the range of 400–600 GeV as perhaps the simplest BSM candidate which 'naturally'explains the data. This picture leads to significant repercussions for the LHC which will be explored.

Author: SONI, Amarjit (BNL)

Presenter: SONI, Amarjit (BNL)

Session Classification: CP-violation I

Track Classification: CP-violation

Contribution ID: **27** Type: **not specified**

Detection of Jets and Photons at ATLAS

Thursday 30 July 2009 16:20 (25 minutes)

The large production rate of jets and photons at the LHC will provide an ideal opportunity for testing perturbative QCD, for constraining the gluon parton density function, as well as for searching for new physics. The finely segmented calorimeters, together with an efficient tracking system, allows for precision measurements of photons and jets. In this presentation, the di-jet, direct photon and di-photon processes are addressed. Related topics, such as photon/jet calibration, separations and cross-section measurements are also discussed.

Author: FANG, Yaquan (University of Wisconsin)

Presenter: FANG, Yaquan (University of Wisconsin)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **28** Type: **not specified**

Neutrino Oscillations: Beams and Reactors

Monday 27 July 2009 14:00 (25 minutes)

Man-made sources of neutrinos from nuclear reactors and particle accelerators provide a well understood source of neutrinos. Reactors are a powerful source of anti-electron neutrinos with energies in the 0.1 - 10 MeV range and a flux of order 10ˆ20 neutrinos/GWth. High intensity proton accelerators produce high purity muon neutrino and anti-muon neutrino beams with energies in the range 100s of MeV to 100s of GeV and fluxes of order 10ˆ21 neutrinos/MW. The different neutrino flavors, large fluxes and wide range of energies available from these terrestrial sources have enabled precision measurements of neutrino oscillation parameters. Both reactor and accelerator based experiments provide the best sensitivity to the value of the last unknown neutrino mixing angle, theta_13. In addition, the next generation of accelerator based experiment will enable the search for CP violation in the leptonic sector. I will review the status of current reactor and accelerator based neutrino oscillation experiments and briefly discuss future directions.

Author: BISHAI, Mary (Brookhaven National Laboratory)

Presenter: BISHAI, Mary (Brookhaven National Laboratory)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **29** Type: **not specified**

Optimization of Integrated Luminosity of the Fermilab Tevatron Collider

Monday 27 July 2009 15:30 (30 minutes)

We present the strategy which has been used recently to optimize integrated luminosity at the Fermilab Tevatron proton-antiproton collider. We use a relatively simple model where we keep the proton intensity fixed, use parameters from fits to the luminosity decay of recent stores as a function of initial antiproton intensity (stash size), and vary the stash size to optimize the integrated luminosity per week. The model assumes a fixed rate of antiproton production, that a store is terminated as soon as the target stash size for the next store is reached, and that the only downtime is due to store turn-around time. An optimal range of stash sizes is predicted. Since the start of Tevatron operations based on this procedure, we have seen an improvement of approximately 35% in integrated luminosity. Other recent operational improvements have been achieved by decreasing the shot-setup time and by reducing beam-beam effects by making the proton and antiproton brightnesses more compatible, for example by scraping protons to smaller emittances.

Author: CONVERY, Mary (Fermilab)

Co-author: GATTUSO, Cons (Fermilab)

Presenter: CONVERY, Mary (Fermilab)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **30** Type: **not specified**

Local alignment of the BaBar Silicon Vertex Tracking detector

Friday 31 July 2009 14:25 (25 minutes)

The BaBar Silicon Vertex Tracker (SVT) is a five-layer double-sided silicon detector designed to provide precise measurements of the position and direction of primary tracks, and to fully reconstruct low-momentum tracks produced in e+e- collisions at the PEP-II asymmetric collider at SLAC. This presentation will describe the design, implementation, performance, and validation of the local alignment procedure used to determine the relative positions and orientations of the 340 SVT wafers. This procedure uses a tuned mix of in situ experimental data and complementary lab-bench measurements to control systematic distortions. Wafer positions and orientations are determined by minimizing a chiˆ2 computed using these data for each wafer individually, iterating to account for between-wafer correlations. A correction for aplanar distortions of the silicon wafers is measured and applied. The net effect of residual misalignments on relevant physical variables is evaluated in special control samples. The BaBar data-sample collected between November 1999 and April 2008 is used in the study of the SVT stability.

Authors: GRITSAN, Andrei (Johns Hopkins University); BROWN, David (LBNL); ROBERTS, Doug (University of Maryland); GUO, Zijin (Johns Hopkins University)

Presenter: GUO, Zijin (Johns Hopkins University)

Session Classification: Detectors II

Track Classification: Detector Technology and R&D

Contribution ID: **31** Type: **not specified**

The OPERA experiment: on the way to the direct observation of nu_mu -> nu_tau oscillation

Tuesday 28 July 2009 15:40 (15 minutes)

The OPERA experiment has been designed to prove the existence of nu_mu -> nu_tau oscillations in the atmospheric sector by the direct observation of nu_tau appearance in the CNGS nu_mu beam, produced at CERN.
The detector, installed at Laboratori Nazionali del Gran Sasso (Italy), 730 km away from the neutrino source, consists of a modular target made of lead - nuclear emulsion bricks complemented by electronic trackers and muon spectrometers.
After the short physics run in October 2007, the experiment started full data-taking with 1.25 kt mass in 2008, when about 1700 interactions were collected.
The current status and the first results from the analysis of 2008 data will be presented.

Author: Dr DE SERIO, Marilisa (I.N.F.N. Bari)

Presenter: Dr DE SERIO, Marilisa (I.N.F.N. Bari)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **32** Type: **not specified**

Full Jet Reconstruction In Heavy Ion Collisions: Prospects and Perils

Friday 31 July 2009 16:30 (30 minutes)

Full jet reconstruction has traditionally been thought to be difficult in heavy ion events, due to large multiplicity backgrounds. The search for new physics in high luminosity p+p collisions at the LHC similarly requires the precise measurement of jets over large backgrounds due to pile up, and has motivated the development a new generation of jet reconstruction algorithms which are also applicable in the heavy ion environment. In this talk I will review the latest results on jet-medium interactions as seen in A+A collisions at RHIC, focusing on the new techniques for full jet reconstruction. We will assess the implications of these results for the LHC.

Author: Dr SALUR, Sevil (LBL)

Presenter: Dr SALUR, Sevil (LBL)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **33** Type: **not specified**

Kinematic Cusps: Determining the Missing Particle Mass at the LHC

Tuesday 28 July 2009 17:50 (20 minutes)

Considering two missing energy particles with odd parity can be decayed from a heavy particle with even parity by two-step cascade, we observe kinematic cusp structures in invariant mass distributions of resonant particle decay into missing particles. Knowing a parent mass from direct resonant decay into standard model particles, we determine the mass of the intermediate particle and the final state missing particle by using the cusped peak and the end point of the distribution. The shape of the cusp distribution does not depend much on the spins and chiral couplings of the particles involved. These features may help identifying the masses of the missing particles for various new physics with weak scale dark matter at the LHC.

Author: Dr KIM, Ian-Woo (University of Wisconsin-Madison)

Presenter: Dr KIM, Ian-Woo (University of Wisconsin-Madison)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **34** Type: **not specified**

Gauge-Invariant Localization of Infinitely Many Gravitational Energies from All Possible Auxiliary Structures

Friday 31 July 2009 15:40 (20 minutes)

The problem of finding a covariant expression for the distribution and conservation of gravitational energy-momentum dates to the 1910s. A suitably covariant infinite-component localization is displayed, reflecting Bergmann's realization that there are infinitely many gravitational energy-momenta. Initially use is made of a flat background metric (or rather, all of them) or connection, because the desired gauge invariance properties are obvious. Partial gauge-fixing then yields an appropriate covariant quantity without any background metric or connection; one version is the collection of pseudotensors of a given type, such as the Einstein pseudotensor, in *every* coordinate system. This solution to the gauge covariance problem is easily adapted to any pseudotensorial expression (Landau-Lifshitz, Goldberg, Papapetrou or the like) or to any tensorial expression built with a background metric or connection. Thus the specific functional form can be chosen on technical grounds such as relating to Noether's theorem and yielding expected values of conserved quantities in certain contexts and then rendered covariant using the procedure described here. The application to angular momentum localization is straightforward. Traditional objections to pseudotensors are based largely on the false assumption that there is only one gravitational energy rather than infinitely many.

Author: Dr PITTS, J. Brian (University of Notre Dame)

Presenter: Dr PITTS, J. Brian (University of Notre Dame)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **35** Type: **not specified**

Early Searches for Contact Interactions in the Dimuon channel at ATLAS

Thursday 30 July 2009 15:00 (20 minutes)

The Standard Model has been successful in describing many fundamental aspects of particle physics. However, there are some remaining puzzles which are not explained within the context of its present framework. We discuss the possibility to discover new physics in the ATLAS Detector via a four-fermion contact interaction, much in the same way Fermi first described Weak interactions. Using a simple ratio method, we find that we can set a 95% C.L. lower limit on the effective scale Lambda = 7.5 TeV (8.7 TeV) for the constructive Left-left Isoscalar Model of quark compositeness with 100 pbˆ-1 (200 pbˆ-1) of data at sqrt(s) = 10 TeV in the dimuon final state.

Author: THOMPSON, Emily (University of Massachusetts)

Co-authors: BLACK, Kevin (Harvard University); WILLOCQ, Stephane (University of Massachusetts)

Presenter: THOMPSON, Emily (University of Massachusetts)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **36** Type: **not specified**

Viscous hydrodynamics with shear and bulk viscosity for Relativistic Heavy Ion Collisions

Thursday 30 July 2009 17:15 (30 minutes)

The viscosity of the QGP is a presently hotly debated subject. Since its computation from first principles is difficult, it is desirable to try to extract it from experimental data. Viscous hydrodynamics provides a tool that can attack this problem and which may work in regions where ideal hydrodynamics begins to fail.\\

Through the efforts of different groups, the elliptic flow has now been widely accepted as the key observable to constrain the QGP shear viscosity. During the last year, several groups have developed numerical codes to solve the equations of causal relativistic fluid dynamics and published first results. We will report on the work of the Ohio State University group on setting up the equations for causal viscous hydrodynamics in 2+1 dimensions [1] and solving them numerically for central and noncentral Cu+Cu and Au+Au collisions at RHIC energies and above. We will discuss shear and bulk viscous effects on the hydrodynamic evolution of energy density, temperature, collective flow, and flow anisotropies, and on the hadron multiplicity, single particle spectra and elliptic flow [2-5]. The dynamical effects of using different versions of the Israel-Stewart second order formalism for causal viscous fluid dynamics will be discussed, resolving the origins of some apparent discrepancies between early results reported by different groups [4]. Viscous entropy production and its influence on the centrality dependence of hadron multiplicities and the multiplicity scaling of eccentricity-scaled elliptic flow will be studied in viscous hydrodynamics [4] and compared with experimental data. The present status of constraining the shear viscosity to entropy ratio of the hot and dense matter created at RHIC will be assessed[5].

[1] U.˜Heinz, H.˜Song and A.˜K.˜Chaudhuri,\emph{“Dissipative hydrodynamics for viscous relativistic fluids,”} Phys. Rev. {\bf C 73}, 034904 (2006)

[2] H.˜Song and U.˜Heinz, \emph{“Suppression of elliptic flow in a minimally viscous quark-gluon plasma,”} Phys. Lett. B {\bf658}, 279 (2008).

[3] H.˜Song and U.˜Heinz, \emph{“Causal viscous hydrodynamics in 2+1 dimensions for relativistic heavy-ion collisions,”} Phys. Rev. {\bf C 77}, 064901 (2008).

[4] H.˜Song and U.˜Heinz, \emph{“Multiplicity scaling in ideal and viscous hydrodynamics,”} Phys. Rev. {\bf C78}, 024902,2008.

[5] H.˜Song and U. Heinz, \emph{“Extracting the QGP viscosity from RHIC data - A Status report from viscous hydrodynamics”} J. Phys. G, in press [arXiv:0812.4274 [nucl-th]].

Author: SONG, Huichao (The Ohio State Univ)

Presenter: SONG, Huichao (The Ohio State Univ)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **37** Type: **not specified**

Cerenkov Light Diagnostics for Superconducting Cavities

Friday 31 July 2009 15:40 (25 minutes)

Field emission is one of the major problems limiting rf cavity performance in accelerators. Superconducting cavities are made of thin metal shells in a metal liquid helium vessel. This system can be viewed as a Cerenkov radiator between a set of mirrors. Field emitted electrons can punch through the cavity wall and generate Cerenkov light in helium which can be collected by appropriate photodetectors. We report on GEANT4 simulation of electron and Cerenkov photon transport in a TESLA-type superconducting cavity to evaluate the feasibility of this method.

Authors: APYAN, Aram (Illinois Institute of Technology); TORUN, Yagmur (Illinois Institute of Technology)

Presenter: APYAN, Aram (Illinois Institute of Technology)

Session Classification: Detectors II

Track Classification: Detector Technology and R&D

Contribution ID: **38** Type: **not specified**

Causal Particle Theory

Causal particle theory requires that a particle's time coordinate be uninvolved with its representative non-commutative matrix algebra. A non-commutative representation algebra has been constructed which both underlies the standard model algebraic group and preserves particle causality. It was proposed that such an algebra be considered –long before the causality criterion was known. As in the Langland paradigm, the hypothesized algebraic group is a one-to-one+onto representation of a partitioned quantum geometry, and is consistent with triangulated quantum gravity. The quantum particle geometry is also referred to as a fractionalized string when considering to black hole theory. Causal particle theory involves particle mass and energy in the form of real and imaginary terms of a partitioned 1-brane's action. In the No-Boundary Wave Function approximation using a sum of extremizing histories, brane action takes the exact same form! –but lacks an algebraic representation of quantum particle states. This exciting equivalence relation calls for significantly expanded research and communication support. Most notably, research directed at understanding string/M-theory's six extra variables must re-consider them as metrics of the six intrinsic degrees of freedom in tripartite brane geometry. This well-formulated approach is made consistent with the empirical formulation approach taken by the New Minimal Standard Model. Currently unexplained particle, astrophysical and cosmological phenomena are inevitable, but still qualitative, predictions of the underlying theory.

Summary

This work revises and expands on earlier DPF02, Cosmo02, PASCOS06, SSLLIS07 presentions by incorporating developments from the New Boundary Wave Function, the New Minimal Standard Model, quantum gravity, among others.

Author: Dr LUNDBERG, Wayne (Architect of Comprehensive Theory)

Presenter: Dr LUNDBERG, Wayne (Architect of Comprehensive Theory)

Track Classification: Beyond the Standard Model

Contribution ID: **39** Type: **not specified**

Upsilon Decays into Scalar Dark Matter

Monday 27 July 2009 18:00 (20 minutes)

We examine $\Upsilon(1S)$ meson decay into a pair of scalar Dark Matter particles and $\Upsilon(3S)$ meson decay into a pair of scalar Dark Matter particles and a photon. To the lowest order in perturbation theory, we perform model-independent analysis and derive formulae for the branching ratios of these decays. We confront our calculation results with the experimental data. We do it both in the model-independent way and within particular models. This way we derive constraints on parameters of the models containing light Dark Matter.

Author: Mr YEGHIYAN, Gagik (Wayne State University)

Co-authors: Prof. PETROV, Alexey (Wayne State University); Mr BADIN, Andriy (Wayne State University)

Presenter: Mr YEGHIYAN, Gagik (Wayne State University)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **40** Type: **not specified**

Lifetime Difference in D^0-$\overline{D}^0$ Mixing within R-Parity Violating SUSY

Friday 31 July 2009 15:40 (20 minutes)

We re-examine constraints from the evidence for observation of the lifetime difference in D^0-$\overline{D}^0$ mixing on the parameters of supersymmetric models with R-parity violation (RPV). We find that RPV SUSY can give large negative contribution to the lifetime difference. We also discuss the importance of the choice of weak or mass basis when placing the constraints on RPV-violating couplings from flavor mixing experiments.

Author: Mr YEGHIYAN, Gagik (Wayne State University)

Co-author: Prof. PETROV, Alexey (Wayne State University)

Presenter: Mr YEGHIYAN, Gagik (Wayne State University)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **44** Type: **not specified**

Observation of Single Top Quark Production with the D0 Detector

Tuesday 28 July 2009 16:45 (25 minutes)

We report first observation of the electroweak production of single top quarks in ppbar collisions at sqrt(s) = 1.96 TeV based on 2.3 fbˆ-1 of data collected by the D0 detector at the Fermilab Tevatron Collider. Using events containing an isolated electron or muon and missing transverse energy, together with jets originating from the fragmentation of b quarks, we measure a cross section of sigma(ppbar -> tb + X, tqb + X) = 3.94 +- 0.88 pb. The probability to measure a cross section at this value or higher in the absence of signal is 2.5 x 10ˆ-7, corresponding to a 5.0 standard deviation significance for the observation.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: Dr GERBER, Cecilia (University of Illinois at Chicago)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **45** Type: **not specified**

The strange quark condensate in the nucleon in 2+1 flavor QCD

Friday 31 July 2009 14:25 (25 minutes)

We use lattice gauge theory including the effects of light and strange dynamical quarks to calculate the "strange quark content of the nucleon", <N| s s$_b ar|N >, which is important for interpreting the results of some dark matter detection experiments. The method is to evaluate quark-line disconnected correlations on the MILC lattice ensembles, which include the effects of dynamical strange quarks. Calculations are done for three different lattice spacings and a range of quark masses. After continuum and chiral extrapolations, the result is $< N|ss_b ar|N >= 0.69 + -0.07(statistical) + -0.09(systematic)$, in the ms_bar(2GeV) regularization.

Author: TOUSSAINT, doug (University of Arizona)

Co-author: FREEMAN, Walter (University of Arizona)

Presenter: TOUSSAINT, doug (University of Arizona)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **47** Type: **not specified**

Commissioning the CMS pixel detector with Cosmic Rays

Tuesday 28 July 2009 14:00 (25 minutes)

The Compact Muon Solenoid (CMS) is one of two general purpose experiments at the Large Hadron Collider. The CMS experiment prides itself on an ambitious, all silicon based, tracking system. After almost 20 years of design and construction the CMS tracker detector has been installed and commissioned. The tracker detector consists of ten layers of silicon microstrip detectors while three layers of pixel detector modules are situated closest to the interaction point. The pixel detector consists of 66M pixels of 100um*150um size, and is designed to use the shape of the actual charge distribution of charged particles to gain hit resolutions down to 12 um. This presentation will focus on commissioning activities in the CMS pixel detector. Results from cosmic ray studies will be presented, in addition to results obtained from the integration of the pixel detector within the CMS detector and various calibration and alignment analyses.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: YORK, Andrew (Unknown)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **48** Type: **not specified**

First Alignment of the CMS Tracker and Implications for the First Collision Data

Tuesday 28 July 2009 14:50 (25 minutes)

We present the first results of the full CMS Silicon Tracker alignment based on several million reconstructed tracks from the cosmic data taken during the commissioning runs with the detector in its final position. Implication for CMS physics performance is discussed. The all-silicon design of the tracking system of the CMS experiment is expected to provide 1-2% resolution for 100 GeV tracks and an efficient tagging of b-jets. To achieve optimal performance the position and orientation of each of the 15148 silicon strip and 1440 silicon pixel modules need to be determined with a precision of several micrometers. For the modules well illuminated by cosmic ray particles, the ultimate precision has been achieved with data from the silicon modules traversed in-situ by charged muons used in combination with survey measurements. The achieved resolution in all five track parameters is controlled with data-driven validation of the track parameter measurements near the interaction region, and tested against prediction with detailed detector simulation. Outlook for expected tracking and physics performance with the first collisions is given.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: GUO, Zijin (Johns Hopkins University-Unknown-Unknown)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **49** Type: **not specified**

Cosmic Muon Analysis with the CMS detector

Tuesday 28 July 2009 17:45 (25 minutes)

Despite of the delay of physics collisions at the Large Hadron Collider (LHC), induced by the incidence in September 2008, the CMS collaboration is utilizing the commissioned detector to take large amounts of cosmic data. About 300 million cosmic events were recorded with the full detector and a magnetic field of 3.8˜T turned on. The effort has provided significant statistics to study the detector performance and analyze the physics of cosmic rays. We present recent results from the cosmic muon analysis activities that were conducted using real cosmic data and dedicated cosmic Monte Carlo samples. Measurements of the cosmic muon charge ratio and the flux measurement were performed and have demonstrated the expected performance of the capability of the CMS detector to do real physics analysis. The cosmic muon analysis effort is not only a dress rehearsal for the physics analysis at the LHC, but also the first physics results of the CMS experiment and provides interesting links to astrophysics.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: LIU, Chang (Purdue University)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **50** Type: **not specified**

Soft Contribution to the Hard Ridge

Friday 31 July 2009 14:25 (25 minutes)

Jet correlation measurements at RHIC show a striking increase in the yield of associated particles in a narrow range in relative azimuthal angle near $\phi \approx 0$. This region of enhanced particle production is called a ridge because it extends over a broad range in relative pseudorapidity. Interestingly, a similar 'soft' ridge of enhanced production has been reported for two-particle correlations {\it without} a jet trigger.

We propose a common explanation for these phenomena based on particle production in an early Glasma stage followed by radial flow. We found excellent agreement with the peak amplitude and azimuthal width shown in current Au-Au data in ref. [3]. Here we extend this work to include Cu-Cu systems. Furthermore, to study the contribution of soft correlations to the hard ridge, we explore not only the soft ridge (in the context of [3]) in different p_t ranges, but also correlations of jets with Glasma flux tubes. We find that correlations of thermally produced pairs are a significant contribution to the triggered measurement.

[1] J. Putschke, et al. (STAR Collaboration), Proceedings of QM06; arXiv:nucl-ex/0701074.
[2] M. Daugherity [STAR Collaboration], J. Phys. G35, 104090 (2008).
[3] Sean Gavin, Larry McLerran, and George Moschelli, Phys. Rev. C79, 051902(R) (2009), arXiv:nucl-th/0806.4718.

Authors: Mr MOSCHELLI, George (Wayne State University); Dr GAVIN, Sean (Wayne State University)

Presenter: Mr MOSCHELLI, George (Wayne State University)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **51** Type: **not specified**

Towards to the First Measurement of the Drell-Yan Dimuon Differential Cross Section with the CMS detector

Tuesday 28 July 2009 16:30 (20 minutes)

We present the strategy of the measurement of the differential cross-section of Drell-Yan dimuon production in early proton-proton collision data produced by the LHC accelerator at $\sqrt{s} =$˜10˜TeV and collected by the CMS detector. We study the Drell-Yan dimuon process for the whole mass range, starting around the Υ peaks, and going through the Z peak to the kinematic limit. Events at the Υ and Z peaks are used to measure the trigger and reconstruction efficiencies from data by tag-and-probe method. Methods for signal selection and background rejection in the different mass ranges, where the sources and magnitude of backgrounds change substantially, are developed. We also discuss the experimental and theoretical systematic uncertainties and the implication for discovery of new physics by searching for deviations.

Author: LIU, Chang (Purdue)

Presenter: LIU, Chang (Purdue)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **52** Type: **not specified**

The CMS Computing System: Successes and Challenges

Monday 27 July 2009 14:00 (30 minutes)

Each LHC experiment will produce datasets with sizes of order one petabyte per year. All of this data must be stored, processed, transferred, simulated and analyzed, which requires a computing system of a larger scale than ever mounted for any particle physics experiment, and possibly for any enterprise in the world. I will discuss how CMS has chosen to address these challenges, focusing on recent tests of the system that demonstrate the experiment's readiness for producing physics results with the first LHC data.

Author: BLOOM

Presenter: BLOOM, Ken (University of Nebraska-Lincoln)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **53** Type: **not specified**

Inclusive W/Z productions at CMS

Tuesday 28 July 2009 15:20 (20 minutes)

At LHC, the production cross sections of the W/Z bosons are at tens to hundreds nanobarns level. Studies of these processes can not only help the detector commissioning, but also help to establish standard candles for exploring beyond-the-SM physics, such as searches for Zprime, Wprime particles. The leptonic decays of W/Z bosons are expected to have very high trigger efficiency and signal to background ratio, therefore they are ideal channels to study the W/Z properties, such as cross sections and asymmetries in details. In this talk, early CMS results on inclusive W/Z productions at 10 TeV center-of-mass energy are discussed.

Author: TAN, Ping (FNAL)

Presenter: TAN, Ping (FNAL)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **54** Type: **not specified**

R-symmetric Gauge Mediation and the MRSSM

Monday 27 July 2009 17:50 (20 minutes)

We present a version of Gauge Mediated Supersymmetry Breaking which preserves an R-symmetry - the gauginos are Dirac particles, the A-terms are zero, and there are four Higgs doublets. This offers an alternative way for gauginos to acquire mass in the supersymmetry-breaking models of Intriligator, Seiberg, and Shih. We investigate the possibility of using R-symmetric gauge mediation to realize the spectrum and large sfermion mixing of the model of Kribs, Poppitz, and Weiner.

Author: Dr BLECHMAN, Andrew (University of Toronto)

Presenter: Dr BLECHMAN, Andrew (University of Toronto)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **55** Type: **not specified**

Study of B0bar,B- –> D(*) p pbar n pi, n=0,1,2 decays

Using the BaBar data sample of 455 million B Bbar pairs, we measure the branching fractions for ten Cabibbo-favored B decays to final states of the form B0bar,B- –> D(*) p pbar n pi, n=0,1,2 and study their decay dynamics.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **57** Type: **not specified**

Measurement of the Branching Fraction of the Decay B0bar −> Lambda_c+ pbar pi0

In a sample of 467 million B Bbar pairs collected with the BaBar detector at the PEP-II collider at SLAC, we observe the decay B0bar −> Lambda_c+ pbar pi0 and measure its branching fraction. An enhancement in the invariant mass of the baryon-antibaryon system at threshold is also observed. No evidence for resonances is found and we calculate a 90% upper limit of the branching fraction BF(B0bar −> Sigma_c+(2455) pbar).

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **59** Type: **not specified**

Search for b –> u transitions in the decays B- –> D(*)0 K-

Thursday 30 July 2009 16:50 (20 minutes)

We report a search for the decays B- –> D0 K-
and B- –> D*0 K- and their charge conjugates*
where the flavor of the neutral D0 meson is ambiguous.
*The final state particles for the D0 K- and D*0 K- modes are
[K+ pi-] K- and ([K+ pi-] pi0) K- or ([K+ pi-] gamma) K-
respectively. These decays are sensitive to the CKM angle gamma due to
interference between the b –> c and b –> u amplitude
contributions, which are of the same order and have a relative weak phase
of gamma. This analysis was first suggested by Atwood, Dunietz, and Soni
(ADS). This is an update, using the full BaBar dataset consisting of 467
million B Bbar pairs, of the previous BaBar B- –> D(*)0 K- ADS analysis.*
It also includes an analysis of the doubly Cabibbo suppressed decays
*B- –> D(*)0 pi- (D0 –> K+ pi-) and their charge conjugates, which are used
as a control sample to test the ADS analysis.

Author: LONG, Owen (University of California Riverside)

Presenter: Dr KASS, Richard (Ohio State University)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **60** Type: **not specified**

Measurement of CP violating asymmetries in B0bar –> D(*)0 K_S0

Using 467 million Upsilon(4S) –> B Bbar decays collected
with the BaBar detector at the PEP-II B factory, we report on
improved measurements of the branching fractions of B0bar –> D(*)0 K_S0
along with a measurement of the weak phase 2 beta + gamma obtained from
a time-dependent analysis of the aforementioned decays.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **61** Type: **not specified**

Measurement of CP observables in B+/- –> D0_CP K+/-

We present an updated measurement of the direct CP asymmetries A_CP+/- and the ratios of the branching fractions R_CP+/- for the decay B- –> D0_CP K- and its charge conjugate, where D0_CP is reconstructed in both non-CP flavor eigenstates and in CP (even and odd) eigenstates. The analysis exploits the full data sample collected with the BaBar detector at the PEP-II e+ e- storage ring, consisting of 467 million Upsilon(4S) –> B Bbar decays.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **62** Type: **not specified**

Measurement of the CKM angle gamma in B-/+ –> D(*) K(*)-/+ decays with a Dalitz plot analysis of D decays to K0_S pi+ pi- and K0_S K+ K-

We present an updated measurement of the CKM unitarity triangle angle gamma using a Dalitz plot analysis of neutral D meson decays to the K0_S pi+ pi- and K0_S K+ K- final states produced in the processes B-/+ –> D() *K-/+, with D* –> D pi0, D gamma, and B-/+ –> D K-/+, *with K*-/+ –> K0_S pi-/+. The analysis is based on the complete data sample consisting of 467 million B Bbar pairs collected by the BaBar detector at the PEP-II e+ e- asymmetric-energy storage rings.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **64** Type: **not specified**

Search for the Decays B+ −> D+ K(*)0

We report on the search for the decays B+ −> D+ K0
and B+ −> D+ K*0 using 467 million B Bbar pairs collected
at the Upsilon(4S) resonance with the BaBar detector at the
PEP-II B factory at SLAC.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **65** Type: **not specified**

Measurement of the Branching Fractions of the Decays B –> D(*)bar D(*) K

We present a measurement of the branching fractions of the 22 decay channels B0 and B+ to D(*)bar D(*) K, where D(*)bar and D(*) are fully reconstructed. The B0 and B+ mesons are reconstructed in a sample of hadronic events for all the possible Dbar D K modes, namely B0 –> D(*)- D(*)0 K+, Dˆ(*)- D(*)+ K0, D(*)0bar D(*)0 K0 and B+ –> D(*)0bar D(*)+ K0, D(*)0bar D(*)0 K+, D(*)- D(*)+ K+. The results are based on 423 fbˆ-1 of data that contained 465 million B Bbar pairs collected at the Upsilon(4S) resonance with the BaBar detector at the PEP-II B factory.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **70** Type: **not specified**

Branching Fraction Measurements of the decays D0 –> Vector Eta

Monday 27 July 2009 15:12 (20 minutes)

We present preliminary results for branching fraction measurements of the decays D0 –> V eta where V is a phi, omega or K*. We use a high statistics data sample collected with the BaBar detector at the PEP-II asymmetric e+ e- collider at SLAC.

Authors: Prof. HONSCHEID, Klaus (Ohio State University); LONG, Owen (University of California Riverside)

Presenter: Prof. HONSCHEID, Klaus (Ohio State University)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **73** Type: **not specified**

Exclusive Initial-State-Radiation Production of the Dbar D, Dbar D*, and D*bar D*, Systems

We perform a study of the exclusive production of Dbar D, Dbar D*, and D*bar D* in initial-state-radiation events, from e+ e- annihilations at a center-of-mass energy near 10.58 GeV, to search for charmonium and possible new resonances. The data sample corresponds to an integrated luminosity of 384 fbˆ-1 and was recorded by the BaBar experiment at the PEP-II storage rings. The Dbar D, Dbar D*, and D*bar D* mass spectra show clear evidence of several psi resonances. However, there is no evidence for Y(4260) –> Dbar D* or Y(4260) –> D*bar D*.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: Hadron Spectroscopy

Contribution ID: **74** Type: **not specified**

Measurement of branching fractions and CP asymmetries in B+->K+pi0, B+->pi+pi0 and B0->pi0pi0 decays with the full BaBar dataset

We present improved measurements of the branching fractions and CP asymmetries in the decays B+->K+pi0, B+->pi+pi0 and B0->pi0pi0. This update is based on 467 Y(4S)->BBbar decays, constituting the complete set of data collected at the Y(4S) resonance by the BaBar experiment at the SLAC PEP-II B-factory.
We determine constraints on the Unitarity Triangle angle alpha from the isospin relation between all B->pipi rates and asymmetries, and we measure the difference in the size of direct CP asymmetries between the decays B+->K+pi0 and B0->K+pi-.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **75** Type: **not specified**

Measurement of CP-violating asymmetries in B0 –> pi+pi- and B0 –> K+pi- with the full BaBar dataset

We present measurements of the CP-violating parameters in the decays B0 –> pi+pi- and B0 –> K+pi- based on all data collected at the Y(4S) resonance by the BaBar experiment at SLAC. We use kinematic and particle-identification information to determine simultaneously in a multidimensional maximum-likelihood fit the CP-violating parameters Spipi and Cpipi that describe the time evolution of the B0 –> pi+pi- system and the charge asymmetry AKpi, which is a measure of direct CP violation in B0 –> K+pi-.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **76** Type: **not specified**

Measurement of CP-violating asymmetries and branching fractions in B+ −> K0pi+ and B+ −> K0barK+ with the full BaBar dataset

We present improved measurements of the CP-violating charge asymmetries and branching fractions in the decays B+ −> K0pi+ and B+ −> K0barK+. The results are based on all data collected at the Y(4S) resonance by the BaBar experiment at SLAC. Signal yields and CP-violating asymmetries are determined simultaneously using kinematic and particle-identification information in a multidimensional maximum-likelihood fit.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **77** Type: **not specified**

Measurement of CP-violating asymmetries and branching fractions in B0 -> K0K0bar with the full BaBar dataset

We present improved measurements of the branching fraction and the CP-violating parameters S and C in the time evolution of the B0 –> K0K0bar system based on all data collected at the Y(4S) resonance by the BaBar experiment at SLAC. Signal yields and CP-violating asymmetries are determined simultaneously using kinematic and B0 flavor-tagging information in a multidimensional maximum-likelihood fit.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **82** Type: **not specified**

Two- and Three-body charmless B decays at BaBar

Thursday 30 July 2009 17:10 (20 minutes)

Two- and Three-body charmless B decays at BaBar

Summary

Combined talk including abstracts 79, 82, 84, 90.

Author: LONG, Owen (University of California Riverside)

Presenter: Dr STRACKA, Simone (Babar Collaboration)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **83** Type: **not specified**

Dalitz Plot Analysis of B Decays

Thursday 30 July 2009 14:50 (35 minutes)

We present a Dalitz-plot analysis of charmless B+/- decays to the final state pi+-pi+-pi-+ using a sample of (465+-5)x10^-6 BBbar pairs collected by the BABAR experiment at \sqrt{s} = 10.58 GeV. We measure the branching fractions and direct CP asymmetries of B+/- to rho0pi+/-, f2(1270)pi+/- and non-resonant pi+pi-pi+/-.

Author: DONG, Liaoyan (SLAC)

Presenter: DONG, Liaoyan (SLAC)

Session Classification: Hadron Spectroscopy II

Track Classification: Hadron Spectroscopy

Contribution ID: **84** Type: **not specified**

Measurement of Branching Fractions and Charge Asymmetry of B Meson Decays to Final States Containing eta or eta' and eta, eta', K, pi, omega and phi.

We present updated measurements of Branching Fractions for neutral B meson decays to eta K^0, eta eta, eta' eta', eta phi, eta omega, eta' phi, eta' omega, and branching fractions and CP-violating charge asymmetries for charged B decays to eta K^+, eta pi^+, eta' K^+, and eta' pi^+. The data sample collected with the BaBar detector at the PEP-II asymmetric-energy B factory at SLAC represents 467 x10^6 B Bbar pairs.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **85** Type: **not specified**

Measurement of Branching Fraction of B decays to K1(1270) pi and K1(1400) pi and CKM angle alpha from a1(1260) pi

We present the measurement of the branching fractions of neutral and charged B meson decays to K1(1270) pi and K1(1400) pi and the estimation of the weak CKM angle alpha from the B0 decays to a1(1260) pi. The data sample collected with the BaBar detector at the PEP-II asymmetric-energy B factory at SLAC represents 465 x10^6 B Bbar pairs.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **86** Type: **not specified**

Charmless hadronic B decays into vector and tensor final states

Thursday 30 July 2009 16:30 (20 minutes)

Author: LONG, Owen (University of California Riverside)

Presenter: Dr GANDINI, Paolo (Babar Collaboration)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **87** Type: **not specified**

Improved measurement of the CKM Angle alpha using B0->rho+rho- decays

We present updated results from an analysis of B0->rho+rho- decays using the full Y(4S) data sample collected with the BABAR detector at the PEP-II asymmetric-energy B Factory at SLAC.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **90** Type: **not specified**

Measurement of Time Dependent CP Asymmetry Parameters in B0 Meson Decays to omega Kˆ0_S, etaʼ Kˆ0, and piˆ0 Kˆ0_S

We present measurements of the time-dependent CP-violation parameters S and C in the decays of B0 mesons to the final states omega Kˆ0_S, etaʼ Kˆ0, and piˆ0 Kˆ0_S. The data sample corresponds to 467 x10ˆ6 BBbar pairs collected by the BaBar detector at the PEP-II asymmetric-energy collider at SLAC.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **91** Type: **not specified**

Improved Measurement of B+ –> rho+ rho0 and Precise Determination of the CKM Angle alpha

We present improved measurements of the
branching fraction, the longitudinal polarization fraction f_L,
and the direct CP asymmetry Acp in the B meson decay channel
B+ –> rho+ rho0. The data sample was collected with the BaBar
detector at SLAC. The results are
BF(B+ –> rho+ rho0) = (23.7 +/- 1.4 +/- 1.4) x 10ˆ-6,
f_L = 0.950 +/- 0.015 +/- 0.006, and Acp = -0.054 +/- 0.055 +/- 0.010,
where the uncertainties are statistical and systematic, respectively.
Based on these results, we perform an isospin
analysis and determine the CKM phase angle
alpha = arg(-VtdVtb/*VudVub*) to be (92.4 +6.0 -6.5) degrees.

Author: LONG, Owen (University of California Riverside)

Presenter: LONG, Owen (University of California Riverside)

Track Classification: CP-violation

Contribution ID: **93** Type: **not specified**

Recent results on two-photon physics at BABAR

Friday 31 July 2009 14:50 (25 minutes)

Two-photon processes produced at e+e- colliders via the reaction e+ e- –> e+ e- gamma gamma*() –> e+ e- X, provide important experimental data for the study of hadronic spectra and testing QCD predictions. We report here on recent results in a number of these channels that are obtained at the PEP-II collider with the BABAR detector. The gamma gamma –> pi0pi0, pi0eta, and etaeta cross sections are measured in the two photon invariant mass range from 2 GeV to 5 GeV using both single tag and no tag techniques. We also present measurements of the photon-meson transition form factors using the single tag technique. The gamma gamma* -> pi0 transition form factor for the momentum transfer range Q2=4-40 GeV2 and the gamma gamma* -> eta_c transition form factor for the range Q2=2-50 GeV2 will be presented.

Author: LONG, Owen (University of California Riverside)

Presenter: Prof. SOKOLOFF, Mike (University of Cincinnati)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **95** Type: **not specified**

A search for the decay B –> l nu gamma

Monday 27 July 2009 16:30 (20 minutes)

We present the search for the radiative leptonic decay modes
B+ -> e nu gamma and B+ -> mu nu gamma using data collected by the
BaBar detector at the PEP-II B-factory. In this analysis, we fully
reconstruct the hadronic decay of one of the B mesons from the
Upsilon(4S) –> BBbar and then search for evidence of the
B+ –> l+ nu gamma decay in the remaining particles in the event. This
method provides clean kinematic information on the signal's missing energy and high
momentum photon and lepton and allows for a model-independent analysis of this decay.
Using approximately 465 million B meson pairs produced by this B-factory,
we obtain sensitivity to branching fractions of the same order as
predicted by the Standard Model.

Author: Ms LINDEMANN, Dana (McGill University)

Presenter: Ms LINDEMANN, Dana (McGill University)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **100** Type: **not specified**

Measurement of Upsilon(1S) –> l+l- and Test of Lepton Universality

Thursday 30 July 2009 17:20 (20 minutes)

Using a sample of 122 million Upsilon(3S) decays collected with the BaBar detector at the PEP-II asymmetric energy collider at the Stanford Linear Accelerator Center, we measure the ratio R = BR(Upsilon(1S) –> tautau)/BR(Upsilon(1S) –> mumu); the measurement is intended as a test of the lepton universality and as a possible search for a light pseudoscalar Higgs boson in NMSSM scenarios. Such a boson could appear in a deviation of the ratio R from 1. The analysis exploits the decays Upsilon(3S) –> Upsilon(1S)pi+pi-, Upsilon(1S) –> l+l-, where l=mu,tau.

Author: GUIDO, Elisa (University & INFN Genova)

Presenter: GUIDO, Elisa (University & INFN Genova)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **105** Type: **not specified**

Measurement and interpretation of moments in Decays B -> Xc ell nu

Monday 27 July 2009 17:18 (20 minutes)

Semileptonic B decays to DXlnu (l = e or mu) are selected by reconstructing D0l and D+l combinations from a sample of 230 million Upsilon(4S) -> BB decays recorded with the BABAR detector at the PEP-II e+e- collider at SLAC. A global fit to these samples in a 3-dimensional space of kinematic variables is used to determine the branching fractions B(B- -> D0 l nu) = (2.34 +/- 0.03 +/- 0.13)% and B(B- -> D*0 l nu) = (5.40 +/- 0.02 +/- 0.21)% where the errors are statistical and systematic, respectively. The fit also determines form factor parameters in a HQET-based parameterization, resulting in rho2_D = 1.20 +/- 0.04+/- 0.07 for B -> D l nu and rho2_D* = 1.22 +/- 0.02 +/- 0.07 for B -> D*l nu. These values are used to obtain the product of the CKM matrix element |Vcb| times the form factor at the zero recoil point for both B -> D l nu |decays, G(1)|V_cb| = (43.1 +/- 0.8 +/- 2.3) 10^-3 , and for B -> D* l nu decays, F(1)|V_cb| = (35.9 +/- 0.2 +/- 1.2) 10^-3 .

Author: FELTRESI, Enrico (INFN Padova)

Presenter: FELTRESI, Enrico (INFN Padova)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **106** Type: **not specified**

Exclusive semileptonic b->c decays at BaBar and the determination of |Vcb|

Monday 27 July 2009 16:54 (20 minutes)

We report a measurement of the branching fractions of B -> D**l nu decays based on 417 fb-1 of data collected at the Upsilon (4S) resonance with the BABAR detector at the PEP-II e+e- storage rings. Events are selected by fully reconstructing one of the B mesons in a hadronic decay mode. A fit to the invariant mass differences m(D(*)pi) - m(D(*)) is performed to extract the signal yields of the different D** states. We observe the B -> D**l nu decay modes corresponding to the four D** states predicted by Heavy Quark Symmetry with a significance greater than five standard deviations including systematic uncertainties.

Authors: Mr FRANCO SEVILLA, Manuel (SLAC); FRANCO SEVILLA, Manuel (SLAC National Accelerator Laboratory-Unknown-Unknown); FRANCO SEVILLA, Manuel (SLAC)

Presenter: Mr FRANCO SEVILLA, Manuel (SLAC)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **115** Type: **not specified**

Search for tau -> mu/e gamma

Friday 31 July 2009 14:00 (20 minutes)

We present a search for the non-conservation of lepton flavor in the decay tau -> mu/e gamma performed with 967 M tau decays from e+e- annihilations collected by the BABAR detector at the PEP-II storage ring at a center-of-mass energy corresponding to Y(2S), Y(3S) and Y(4S) resonances.

Author: BANERJEE, Swagato (University of Victoria)

Presenter: BANERJEE, Swagato (University of Victoria)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **116** Type: **not specified**

Selected Results in Tau Physics in BaBar

Monday 27 July 2009 17:42 (20 minutes)

Author: PARAMESVARAN, Sudarshan (Royal Holloway, University of London)

Presenter: PARAMESVARAN, Sudarshan (Royal Holloway, University of London)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **119** Type: **not specified**

Search for a Light CP-Odd and Scaler Higgs in Upsilon Data

Tuesday 28 July 2009 15:00 (20 minutes)

We search for a light CP-odd Higgs boson, Aˆ0, in the radiative decay of Y(3S) −> gamma Aˆ0, Aˆ0 −> tau+ tau-, tau+ −> e+ nu_e nubar_tau or tau+ −> mu+ nu_mu nubar_tau. The data sample contains 122 million Y(3S) events collected with the BaBar detector. We find no evidence for a narrow structure in the studied mass region of 4.03 < m_{Aˆ0} < 10.10 GeV/cˆ2 and set the 90% C.L. upper limits on the branching fraction product BR(Y(3S) −> gamma Aˆ0) x BR(Aˆ0 −> tau+ tau-) in that mass range. We also set an upper limit on the tau-decays of the recently discovered eta_b meson.

Authors: LONG, Owen (University of California Riverside); TBA

Presenter: Prof. KOLOMENSKY, Yury (University of California, Berkeley)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **120** Type: **not specified**

A Search for Invisible Decay of the Y(1S)

Thursday 30 July 2009 16:55 (20 minutes)

The nature of dark matter is a challenge to both astrophysics and collider physics. Dark matter may have both heavy and light constituents, much like the normal matter described by the Standard Model. We present a search for decay of the Y(1S) meson into undetectable final states, using a sample of 98 million Y(3S) mesons collected at the PEP-II/BaBar B-factory. We tag the decay of the Y(3S) into the Y(1S) through a pair of charged pions, and measure the rate at which the Y(1S) decays into particles which do not interact with the BaBar detector.

Author: KOLOMENSKY, Yury (UC Berkeley/LBNL)

Presenter: KOLOMENSKY, Yury (UC Berkeley/LBNL)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **121** Type: **not specified**

Search for Lepton-Flavor Violating Upsilon Decays at BaBar

Friday 31 July 2009 14:20 (20 minutes)

Charged lepton-flavor violating (CLFV) processes are extremely rare in the Standard Model, but they may occur in various beyond-the-Standard Model (BSM) theories, including SUSY or models with leptoquarks or compositeness. We present a search CLFV decays Upsilon –> e+ tau- and Upsilon –> mu+ tau- which probes BSM contributions at the TeV mass scales.

Author: BANERJEE, Swagato (University of Victoria)

Presenter: BANERJEE, Swagato (University of Victoria)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **124** Type: **not specified**

Search for the Standard Model Higgs Boson produced in Vector Boson Fusion and decaying into tau pair in CMS with 1fb-1 of luminosity

Monday 27 July 2009 17:20 (20 minutes)

A prospective analysis is presented on the observability of the Standard Model Higgs boson produced in the Vector Boson fusion and decaying into tau-tau pair with the tau-tau->lvv+tau-jet v final state. The estimates of the upper limit on the cross section times branching ratio for 1fb-1 for the Higgs boson mass interval 115-145 GeV/c2 are given.

Authors: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown); TBA

Presenter: Dr RAHMAT, Rahmat (University of Mississippi)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **125** Type: **not specified**

H to WW and ZZ and projected exclusion limits on the SM Higgs boson cross sections

Thursday 30 July 2009 15:00 (20 minutes)

We present an evaluation of the CMS expected 95\% C.L. exclusion limits in early Higgs boson searches. The results are based on a statistical combinations of multiple recent Monte-Carlo analyses: $H \to WW^* \to 2l2\nu$ and $H \to ZZ^* \to 4l$ decay channels, where l stands for e or μ. We show that these two channels alone should allow for excluding the Standard Model Higgs boson in the mass range of 140-230 GeV by the time when CMS collects 1˜fb^{-1} of data at a center-of-mass energy of 14 TeV. We also give an estimate of how the change of the LHC center-of-mass collision energy from 14 to 10 TeV would impact the Higgs boson exclusion limits.

Authors: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown); TBA

Presenter: Dr DROZDETSKIY, Alexey (University of Florida)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **126** Type: **not specified**

ArgoNeuT: A Liquid Argon Time Projection Chamber Test in the NuMI Beamline

Thursday 30 July 2009 17:05 (25 minutes)

Liquid Argon Time Pro jection Chamber (LAr TPC) detectors are ideally suited for studying neutrino interactions and probing the parameters that characterize neutrino oscillations. The ability to drift ionization particles over long distances in purified argon and to trigger on abundant scintillation light allows for excellent particle identification and triggering capability. In this talk the details of the ArgoNeuT (Argon Neutrino Test) test-beam pro ject will be presented. ArgoNeuT is a 175 liter LAr TPC exposed to Fermilab's NuMI neutrino beamline. The first neutrino interactions observed in ArgoNeuT will be presented, along with discussion of the various physics analyses to be performed on this data sample.

Author: Dr SODERBERG, Mitchell (Yale University)

Presenter: Dr SODERBERG, Mitchell (Yale University)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **127** Type: **not specified**

Prospects for Standard Model Higgs physics with the ATLAS Detector at the LHC

Thursday 30 July 2009 17:25 (20 minutes)

The search for the Higgs boson is a crucial element of the
physics program of the LHC. This talk will give an overview of the Standard Model Higgs boson searches under study within ATLAS, with an emphasis on
background normalization strategies. Special attention will be given
to the search for Higgs bosons in the H->WW decay mode, since this
channel is of particular interest for the early data-taking.

Author: Dr QUAYLE, William (High Energy Physics-Department of Physics-University of Wisconsi)

Presenter: Dr CARRILLO-MONTOYA, German (University of Wisconsin, Madison)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **128** Type: **not specified**

Discovery Potential for MSSM Higgs Bosons with the ATLAS experiment at the LHC

Thursday 30 July 2009 17:00 (20 minutes)

The discovery of a neutral Higgs boson with large branching fractions into tau or muon pair final states would be strong evidence of new physics beyond the Standard Model, as would the discovery of a charged Higgs boson. The discovery potential for neutral and charged Higgs bosons in the Minimal Supersymmetric Extension of the Standard Model (MSSM) with the ATLAS detector at the LHC is presented. The results shown are based on the analysis of fully-simulated Monte Carlo samples and assume an integrated luminosity between 1 and 30 fb-1.

Author: Dr VICKEY, Trevor (High Energy Physics-Department of Physics-University of Wisconsi)

Presenter: Dr VICKEY, Trevor (High Energy Physics-Department of Physics-University of Wisconsi)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **129** Type: **not specified**

Discovery Potential for Di-lepton and Lepton+Etmiss Resonances at High Mass with ATLAS

Thursday 30 July 2009 15:20 (20 minutes)

The discovery potential for a heavy new resonance decaying into di-lepton pairs, or into a high pT lepton and missing ET, using the ATLAS detector at the LHC is presented. Due to the simplicity and robustness of the the di-lepton (or lepton+ETmiss) final states, they are ideal channels in which to search for new physics. The unprecedented center-of-mass energy available at the LHC allows for the exploration of mass regions that are inaccessible to present-day colliders. The prospects for discovering physics beyond the Standard Model with an integrated luminosity in the range between 100 pb-1 and 10 fb-1 are discussed.

Author: Ms PEDRAZA, Isabel (High Energy Physics-Department of Physics-University of Wisconsi)

Presenter: Ms PEDRAZA, Isabel (High Energy Physics-Department of Physics-University of Wisconsi)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **130** Type: **not specified**

Inclusive search for Supersymmetry with missing transverse energy signatures in ATLAS

Tuesday 28 July 2009 14:40 (20 minutes)

An inclusive search for Supersymmetry based on lepton(s), multi-jets and missing transverse energy final state is studied in ATLAS. We discuss discovery potential for SUSY signal in the early LHC data with low integrated luminosity at 10 TeV CM energy.

Author: Dr SARANGI, Tapas (High Energy Physics-Department of Physics-University of Wisconsi)

Presenter: Dr SARANGI, Tapas (High Energy Physics-Department of Physics-University of Wisconsi)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **131** Type: **not specified**

Development of FTK Architecture: A Fast Hardware Track Trigger for the ATLAS Detector

Thursday 30 July 2009 14:25 (25 minutes)

As the LHC luminosity is ramped up to the design level of 10ˆ34 cm−2 s−1 and beyond, the high rates, multiplicities, and energies of particles seen by the detectors will pose a unique challenge. Only a tiny fraction of the produced collisions can be stored on tape and immense real-time data reduction is needed. An effective trigger system must maintain high trigger efficiencies for the physics we are most interested in, and at the same time suppress the enormous QCD backgrounds. This requires massive computing power to minimize the online execution time of complex algorithms. A multi-level trigger is an effective solution for an otherwise impossible problem.

The Fast Tracker (FTK)[1], [2] is a proposed upgrade to the current ATLAS trigger system that will operate at full Level-1 output rates and provide high quality tracks reconstructed over the entire detector by the start of processing in Level-2. FTK solves the combinatorial challenge inherent to tracking by exploiting massive parallelism of associative memories that can compare inner detector hits to millions of pre-calculated patterns simultaneously. The tracking problem within matched patterns is further simplified by using pre-computed linearized fitting constants and leveraging fast DSP's in modern commercial FPGA's. Overall, FTK is able to compute the helix parameters for all tracks in an event and apply quality cuts in approximately one millisecond. By employing a pipelined architecture, FTK is able to continuously operate at Level-1 rates without deadtime.

The system design is defined and studied with respect to high-Pt Level-2 objects: b-jets, tau-jets, and isolated leptons. We test FTK algorithms using ATLAS full simulation with WH events at the LHC design luminosity. The reconstruction quality is evaluated comparing FTK results with the tracking capability of an offline tracking algorithm. Finally, we compare several architectural choices to optimize the latency and hardware system size.

References

[1] A. Annovi et al. The fast tracker processor for hadronic collider triggers. IEEE Transactions on Nuclear Science, 48:575–580, 2001.

[2] A. Annovi et al. Hadron collider triggers with high-quality tracking at very high event rates. IEEE Transactions on Nuclear Science, 51:391–400, 2004.

Author: Mr KAPLIY, Anton (University of Chicago)

Presenter: Mr KAPLIY, Anton (University of Chicago)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **133** Type: **not specified**

Search for electron neutrino appearance in the MINOS experiment

Monday 27 July 2009 15:40 (15 minutes)

MINOS is a long baseline neutrino oscillation experiment situated along Fermilab's high-intensity NuMI neutrino beam. The beam traverses two large iron-scintillator tracking calorimeters: the 0.98 kton near detector located 1 km from the production target and the 5.4 kton far detector sited 735 km downstream in the Soudan mine in northern Minnesota. By looking for an excess of candidate ν_e events at the far detector, MINOS has performed a preliminary search for subdominant $\nu_\mu \to \nu_e$ oscillations in the atmospheric regime. We present the analysis developed for this search and the $\sin^2 2\theta_{13}$ limits obtained. We also describe the upgrades and outlook for the full analysis, which uses 2.3$\times$ more data and is expected out next year. MINOS has the sensitivity to provide the first hint of a non-zero θ_{13} or to set a new upper limit, surpassing that from the CHOOZ reactor experiment.

Author: PATTERSON, Ryan (California Institute of Technology)

Presenter: PATTERSON, Ryan (California Institute of Technology)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **134** Type: **not specified**

MINOS near-detector data decomposition and far-detector extrapolation

Monday 27 July 2009 16:50 (15 minutes)

The MINOS experiment at Fermilab uses two functionally identical detectors, the near detector at Fermilab and the far detector at Soudan Mine in Minnesota, to search for the muon-neutrino to electron-neutrino oscillations and potentially constrain the last unknown mixing angle in the 3-flavor lepton mixing matrix. In order to estimate the backgrounds in the far detector, where the potential oscillations can be measured, we need to understand the beam composition at the near detector. I will discuss a data-driven method for decomposing the near detector data which utilizes data taken in two different beam configurations. The resulting background expectation at the far detector will also be discussed.

Author: SWAIN, Sanjay (Stanford University)

Presenter: SWAIN, Sanjay (Stanford University)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **135** Type: **not specified**

Muon Collider 6D Cooling Simulations

Tuesday 28 July 2009 16:30 (30 minutes)

In the current Muon Collider design the muon beam 6D phase space volume must be reduced several orders in magnitude in order to be able to further accelerate it and inject it into the storage ring. Ionization cooling is currently the only feasible option for cooling the beam within the muon lifetime. The RFOFO ring is one of the feasible options currently under active investigation along with other designs. The RFOFO ring provides a significant reduction in the six-dimensional emittance in a small number of turns with a relatively low particle loss factor. However, the injection and extraction are challenging, and the overheating of the absorbers is an issue.

Two lattices mitigating these issues are simulated and analyzed: the RFOFO helix, also known as the Guggenheim channel, and the open cell lattice. The open cavity lattice is aimed at resolving another important problem, namely, the RF cavity breakdown in the presence of strong magnetic fields.

To demonstrate the six-dimensional cooling, it is proposed to use a wedge absorber in Step IV of the international Muon Ionization Cooling Experiment. Relevant beam tracking studies are presented.

Author: Dr SNOPOK, Pavel (UC Riverside)

Co-author: Prof. HANSON, Gail (UC Riverside)

Presenter: Dr SNOPOK, Pavel (UC Riverside)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **136** Type: **not specified**

Gadolinium study for a water Cherenkov detector

Thursday 30 July 2009 15:40 (15 minutes)

Modification of large water Cherenkov detectors by addition of gadolinium has been proposed. The large cross section for neutron capture on Gd will greatly improve the sensitivity to antielectron neutrinos from supernovae and reactors. A five-year project to build and develop a prototype detector based on Super-Kamiokande (SK) has been approved. We are performing various studies, including a material soak test in Gd solution, light attenuation length measurements, purification system development, and neutron tagging efficiency measurements using SK data and a Geant4-based simulation. We present an overview of the project and the recent R&D results.

Author: KIBAYASHI, Atsuko (Okayama University)

Presenter: KIBAYASHI, Atsuko (Okayama University)

Session Classification: Neutrino Physics III

Track Classification: Neutrino Physics

Contribution ID: **137** Type: **not specified**

Top Mass from Jet Distributions

Tuesday 28 July 2009 17:25 (15 minutes)

A new factorization theorem for the precision extraction of the top mass from top pair production far above threshold at the ILC is presented. The factorization theorem gives a precise relation between the measurement of properties of top jet distributions, such as thrust or hemisphere invariant mass, and the top mass. The observable is shown to be sensitive to a new class of top mass schemes called 'top resonance' schemes which can be converted to the well known MS top mass schemes. The factorization theorem sums large logarithms involving the center of mass energy, the top mass, and the top width via renormalization group equations in a sequence of effective field theories. NLL resummed results are presented.

Author: Dr MANTRY, Sonny (University of Wisconsin at Madison)

Co-authors: Prof. HOANG, Andre (Max Planck Institute in Munich); Prof. STEWART, Iain (MIT); Prof. FLEMING, Sean (University of Arizona at Tuscon)

Presenter: Dr MANTRY, Sonny (University of Wisconsin at Madison)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **138** Type: **not specified**

Solar Neutrino Measurements at Super-Kamiokande-III

Monday 27 July 2009 15:00 (15 minutes)

The full Super-Kamiokande-III data-taking period, which ran from August of 2006 through August of 2008, yielded 298 live days worth of solar neutrino data with a lower total energy threshold of 4.5 MeV. During this period we made many improvements to the experiment's hardware and software, with particular emphasis on its water purification system and Monte Carlo simulations. As a result of these efforts, we have significantly reduced the low energy backgrounds as compared to earlier periods of detector operation, cut the systematic errors by nearly a factor of two, and achieved a 4.5 MeV energy threshold for the solar neutrino analysis. In this presentation, I will present the preliminary SK-III solar neutrino measurement results.

Author: YANG, Byeongsu (Seoul National University)

Presenter: YANG, Byeongsu (Seoul National University)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **139** Type: **not specified**

Time-dependent CP violation in radiative B decays

Monday 27 July 2009 14:30 (20 minutes)

We report measurements of time-dependent CP-violation parameters in radiative modes where a B^0 meson decays to $\phi K^0_S\gamma$, $\omega K^0_S\gamma$, $K^0_S\rho^0\gamma$ and $K^0_S\pi^0\gamma$ final states. These results are based on a large data sample collected at the $\Upsilon(4S)$ resonance with the Belle detector at the KEKB energy-asymmetric e^+e^- collider and are sensitive to right-handed currents from new physics. We also report updated measurements of branching fractions in $B \to \phi K^+(K^0_S)\gamma$ decays and new measurements of $B \to \omega K^+(K^0_S)\gamma$ decays.

Author: Mr SAHOO, Himansu (University of Hawaii)

Presenter: Mr SAHOO, Himansu (University of Hawaii)

Session Classification: CP-violation I

Track Classification: CP-violation

Contribution ID: **140** Type: **not specified**

Antiproton accumulation and cooling at Fermilab's Recycler ring

Monday 27 July 2009 16:30 (30 minutes)

A permanent –magnet, 3.3 km 8 GeV Recycler ring is used to accumulate antiprotons and prepare them for Tevatron shots. Two cooling systems, stochastic and electron, allows increasing of the antiproton phase density by a factor of ˜ 50 and storing up to 5⊠1012 antiprotons with the storage efficiency above 90%. The paper will describe the status of the Recycler ring and its operation.

Author: SHEMYAKIN, Alexander (Fermilab)

Presenter: SHEMYAKIN, Alexander (Fermilab)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **141** Type: **not specified**

Setting Limits on Gauge Mediated Supersymmetry Breaking Models with Photons at CDF

Monday 27 July 2009 15:20 (20 minutes)

Models of supersymmetry predict new heavy, neutral particles, known as a neutralino, that can decay to a photon and the lightest supersymmetric particle, the gravitino. We present a search for these particles in proton anti-proton collisions at sqrt{s}=1.96 TeV at the Collider Detector at Fermilab. After years of data taking we find no evidence for this process and set the world's best limits on models of Gauge Mediated Supersymmetry Breaking.

Author: Mr LEE, Eunsin (Texas A&M University)

Presenter: Mr LEE, Eunsin (Texas A&M University)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **142** Type: **not specified**

Addressing the "Inverse Problem" of Multichannel Particle Searches: A Model-independent Approach to Supersymmetry Search with Trileptons

Monday 27 July 2009 15:00 (20 minutes)

Using supersymmetry search with trileptons as an example, we address the problem of discerning new physics when it manifests itself in multiple channels simultaneously with several models vying
to accommodate the findings. This is best achieved by presenting experimental results in a model-independent fashion, but suitably parametrized to allow for their interpretation in most models. The
interpretation of recent supersymmetric trilepton searches at the hadron collider experiments has been restricted to the mSUGRA model. We show how to extend the trilepton results to other models
by categorizing the experimental sensitivity by the τ lepton content of the signal and parametrizing it
in terms of three key superparticle masses. We demonstrate our method by applying it to the recent
Tevatron bounds and estimate the future Tevatron sensitivity in the trilepton channel. Further, we systematically identify the trilepton-rich sectors of the superpartner mass parameter space and also
evaluate the τ -lepton flavor content of the signal.

Authors: Mr SOOD, Alexander (Rutgers, The State University of New Jersey); Mr GLATZER, Julian (University of Freiburg); Prof. THOMAS, Scott (Rutgers, The State University of New Jersey); Dr DUBE, Sourabh (Lawrence Berkeley National Laboratory); Prof. SOMALWAR, Sunil (Rutgers, The State University of New Jersey)

Presenter: Mr SOOD, Alexander (Rutgers, The State University of New Jersey)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **143** Type: **not specified**

Identifying Electron Neutrino Events in MINOS

Monday 27 July 2009 16:30 (15 minutes)

The reach of the search for electron-neutrino appearance in the MINOS far detector, a process which would manifest a non-zero value of the θ_{13} mixing angle, depends primarily on the ability to separate the signal from the backgrounds. MINOS is using two different approaches for event classification. One selector is an artificial neural network, which relies on topological variables that describe the shape of the showers. The other selector is a novel approach where each event in the data is compared to very large libraries of simulated signal and background events, and a discriminant is constructed from the properties of the N best matches. The intricacies and the performance of both methods are reviewed in this talk.

Author: OCHOA, Pedro (Caltech)

Presenter: OCHOA, Pedro (Caltech)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **144** Type: **not specified**

Singlet scalar dark matter effects on Higgs boson driven inflation

Monday 27 July 2009 17:40 (20 minutes)

A minimal candidate for dark matter is provided by a single standard model singlet.
The quantum mechanical effects of this singlet are explored in a model where the Higgs boson has a large non-minimal coupling to the Ricci scalar and plays the role of the inflaton. Imposition of the slow roll inflation cosmological constraints restricts the allowed values of the Higgs boson mass, its coupling to the dark matter and the dark matter self-coupling.

Author: Prof. LOVE, Sherwin (Purdue University)

Presenter: Prof. LOVE, Sherwin (Purdue University)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **145** Type: **not specified**

A Theoretical Value for the Newton Gravitation Constant from the GEM Unification Theory of Gravity and Electro-Magnetism

The GEM(Gravity E&M) theory (Brandenburg 2007) is an alloy of the Sahkarov and Kaluza-Klein theories of EM and gravitation and allows the derivation of the Newton Gravitation Constant from first principles, and the two postulates of the GEM theory: 1. that gravity and EM forces, and electrons and protons are unified at the Planck length rP and split apart with the apprearance of a hidden fifth dimension. 2. That Gravity fields are an array of ExB drifts or pointing cells. Electron and protons are assumed to arise from the vacuum in a splitting of a lightlike interval into a timelike piece , (the electron) and spacelike piece ,(the proton,) with the three quarks corresponding to the three space dimensions. The first postulate allows the estimate the size of the new hidden dimension (esu units) ro =eˆ2/(mocˆ2) mo= (mpme) ˆ½ where mp and me are the proton and electron masses respectivelyand arrives at the formula
Ln (ro/rP) =(mp/me)ˆ1/2 =42.8503⋯which , when inverted becomes the formula
G= eˆ2/(mpme) alpha exp(-2(mp/me)1/2) = 6.668x 10ˆ -11 N-mˆ2/kgˆ2 This can be contrasted with the formula for G ˜ alphaˆ-1 exp (-Pi/4alpha) proposed by t'Hooft, (1989) derived from gravity models coexisting with thermal EM fields. Brandenburg, J. E. (2007) IEEE Trans.Plasma Sci. Vol. 35, No. 4. , p845. t'Hooft G. (1989) Nuc. Phys. B315 p517

Summary

The appearance of a Kaluza-Klein fifth dimension as a new degree of freedom in a 4-vacuum is postulated to allow the separate appearance of both EM and gravity fields and baryon and lepton number from the Planck scale, where they were before unified. A highy accurate formula for the Newton Gravitation constant G results(1 part per thousand) Gravity is postulated to exist as an array of ExB drifts or Poynting cells. A vacuum unstable to the production of charged particle pairs: protons and electrons,results, leading to continual inflation satisfying the Dirac large number hypothesis G˜1/Hubble Time. Brandenburg, J. E. (2007) IEEE Trans.Plasma Sci. Vol. 35, No. 4. , p845 and references therein.

Author: BRANDENBURG, john (Orbital Technologies Corporation)

Presenter: BRANDENBURG, john (Orbital Technologies Corporation)

Track Classification: Beyond the Standard Model

Contribution ID: **146** Type: **not specified**

The GEM theory, The Wyler Formulas and the All-Encompassing Nature of Planckian Physics

In the GEM unification theory (Brandenburg 2007) a deep connection is found between alpha, the fine structure constant, and the proton/electron mass ratio. This is understood since the Wyler-Lenz formula (Wyler 1971) for alpha and the Wyler-Lenz proton/electron mass ratio formula can be hueristically derived by the assumption Planckian spectra in the proton and in the vacuum. It is found that the mass ratio Wyler-Lenz formula 6Piˆ5 = mp/me =1836.15 can be found simply from a model of protons and electrons as equal sized spheres of 1.4fm with electrons being electrostatic and protons being filled with three Planckian EM radiation fields , each representing a quark, of approximate temperature of the neutral pion rest mass. Likewise, the Wyler Formula written as alphaˆ-1=(80/3Pi)(2Piˆ5/15)ˆ3/4 =137.036 can be derived from the probability of an electron absorbing and emitting a photon as a miniature cubic black body equated to it being also as a miniature perfectly conducting cube of the same surface area. Brandenburg, J. E. (2007) IEEE Trans.Plasma Sci. Vol. 35, No. 4. , p845. Wyler A. (1971) Acad. Sci. Paris, Comtes Rendus, 271A, 180.

Summary

Wlyler has been vindicated is his contention that two of the fundamental constants of nature can be understood approximately as a result of underlying the mathematical structure of EM interactions with matter. Both the Wyler formulas are, in fact, rationalized forms of the Stefan-Boltzman constant , describing integrals over Planckian EM fields. The Wyler-Lenz formula for the proton electron mass ratio can be approximately derived by assuming that the quark-gluon fields inside of the proton form three independent Planck spectra with temperatures of approxiamtely a neutral pion mass and are in a radiation enclosure of a nucleon radius which is approximately 1.4fm in radius, as is the electron electrostatic classical radius. Alpha is found as the ratio of relectance of a cubic black body to a perfectly conducting cube of the same dimensions.

Author: BRANDENBURG, john (Orbital Technologies Corporation)

Presenter: BRANDENBURG, john (Orbital Technologies Corporation)

Track Classification: Beyond the Standard Model

Contribution ID: **147** Type: **not specified**

Standard Model Higgs Production

Monday 27 July 2009 14:00 (30 minutes)

We review the most recent theoretical developments for the Standard Model Higgs production in Hadron Colliders.

Author: Dr BOUGHEZAL, Radja (Univ. of Zurich)

Presenter: Dr BOUGHEZAL, Radja (Univ. of Zurich)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **148** Type: **not specified**

Speeding up simulations of relativistic systems using an optimal boosted frame

Monday 27 July 2009 17:00 (30 minutes)

It was shown recently that it can be computationally advantageous to perform computer simulations in a Lorentz boosted frame for a certain class of relativistic systems such as: free electron laser, laser-plasma accelerator, and particle beams interacting with electron clouds [1], and reduction by orders of magnitude in computer simulation run times using methods based on first-principles (e.g., Particle-In-Cell) was demonstrated. However, even if the computer model relies on a covariant set of equations, we have shown that in order to take the full benefits of the calculation in a boosted frame, some of the standard numerical techniques needed to be revised [2]. Further complications arise from the need to transform input and output data between the laboratory frame and the frame of calculation, although these can be overcome at low additional computational cost [3]. We will present the theory behind the speed-up of numerical simulation in a boosted frame, our latest developments of numerical methods, and examples of application to the modeling of the above-cited problems and others if applicable.

[1] J.-L. Vay, Phys. Rev. Lett. 98, 130405 (2007)
[2] J.-L. Vay, Phys. of Plasmas 14, 1 (2008)
[3] J.-L. Vay et al., Proc. Particle Accelerator Conference, Vancouver, Canada (2009)

Supported by US-DOE Contracts DE-AC02-05CH11231 and DE-AC52-07NA27344, US-LHC program LARP, and US-DOE SciDAC program ComPASS. Used resources of NERSC, supported by US-DOE Contract DE-AC02-05CH11231.

Author: Dr VAY, Jean-Luc (Lawrence Berkeley National Laboratory)

Co-authors: Dr GEDDES, Cameron (Lawrence Berkeley National Laboratory); Dr FURMAN, Miguel (Lawrence Berkeley National Laboratory); Dr FAWLEY, William (Lawrence Berkeley National Laboratory)

Presenter: Dr VAY, Jean-Luc (Lawrence Berkeley National Laboratory)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **151** Type: **not specified**

Top quark mass measurement using mT2 at CDF

Tuesday 28 July 2009 17:10 (15 minutes)

For the Tevatron and future LHC searches of new physics at the TeV scale, the mass determination of particles pair produced with final states characterized by the presence of missing transverse momenta is of great importance. Within the various methods for mass determination, mT2 is one of the best observables. This variable has been extensively studied relying until now on Monte Carlo Simulations. Using for the first time the mT2 observable in data, we measured the top quark mass in the dilepton channel in a sample of 3.4 fb-1.

Presenter:

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **154** Type: **not specified**

Prospects for studying the ttbar invariant mass spectrum and the ttbar spin correlations at CMS

The top quark was discovered at the Tevatron in 1995. For the last decade the study of its properties has been a major theme in the worldwide experimental high energy physics program. The advent of the LHC opens up a new era in top quark physics; because of the large ttbar cross-section and the high luminosity, the LHC can be thought of as a top factory.

Here we report on prospects for studying of ttbar invariant mass spectrum and the ttbar spin correlation in pp collisions at a center of mass of 10 TeV with the CMS detector.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Track Classification: Top Quark Physics

Contribution ID: **155** Type: **not specified**

Diboson production at the LHC with the CMS detector

We discuss prospects for studying diboson production at the LHC with the CMS detector

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **156** Type: **not specified**

MiniBooNE Update

Tuesday 28 July 2009 16:50 (15 minutes)

Since its 2007 electron neutrino search result in 2007, the MiniBooNE collaboration has continued to press forward with additional neutrino and antineutrino running, an expanded investigation of the low energy excess seen in its first results, appearance and disappearance analyses in both neutrino and antineutrino data samples, and an array of unprecedented cross-section measurements. This presentation will highlight some of these recent results, and point to some plans for the future.

Author: NIENABER, PAUL (SAINT MARY'S UNIVERSITY OF MINNESOTA)

Co-author: MINIBOONE COLLABORATION, The (Fermilab, et al.)

Presenter: NIENABER, PAUL (SAINT MARY'S UNIVERSITY OF MINNESOTA)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **157** Type: **not specified**

Inclusive and exclusive B decays with radiative and electroweak penguins at Belle

Thursday 30 July 2009 17:30 (20 minutes)

The loops involved in $b \to s$ penguin transitions provide sensitivity for precision tests of the Standard Model and searches for new physics. We present measurements of inclusive and exclusive radiative and electroweak B decays from the Belle detector, located at the KEKB asymmetric e^+e^- collider, which has collected the world's largest sample of data at the $\Upsilon(4S)$ resonance.

Author: NISHIMURA, Kurtis (University of Hawaii)

Presenter: NISHIMURA, Kurtis (University of Hawaii)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **158** Type: **not specified**

Hadro-Chemistry with High-PT Particles in Nuclear Collisions

Friday 31 July 2009 18:00 (30 minutes)

I will discuss some basic ideas about changes in the chemical composition of QCD jets traversing nuclear matter. I will focus in particular on "conversions" of jets in quark gluon plasma and their effect on spectra and azimuthal asymmetries of high-PT hadrons and photons. I discuss possible signatures at RHIC and the LHC heavy ion program and review recent experimental results.

Author: Prof. FRIES, Rainer (Texas A&M University & RBRC)

Presenter: Prof. FRIES, Rainer (Texas A&M University & RBRC)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **160** Type: **not specified**

Alignment of the ATLAS Inner Detector tracking system

Tuesday 28 July 2009 15:15 (25 minutes)

Alignment of the ATLAS Inner Detector tracking system

The Large Hadron Collider (LHC) at CERN is the world's largest particle accelerator. It will collide two
proton beams at an unprecedented centre of mass energy of 14 TeV. ATLAS is equipped with a charged-particle tracking system built on two technologies: silicon and drift-tube based detectors, constituting the ATLAS Inner Detector (ID). The alignment of the tracking system poses a challenge,
requiring the solution of a linear equation with almost 36000 degrees of freedom. The required precision
for the alignment of the silicon sensors in the most sensitive direction is just a few microns. This limit comes from the requirement that the misalignment should not worsen the resolution of the track
parameter measurements by more than 20%. So far the proposed alignment algorithms are exercised
on several applications. We will present the outline of the alignment approach and results using real
data from cosmic rays and large-scale computing simulation of physics samples mimicking the ATLAS operation during real data taking. The full alignment chain is tested using that stream and alignment constants are produced and validated within 24 hours. Cosmic ray data serves to produce
an early alignment of the real ATLAS Inner Detector even before the LHC start-up. The impact of the
alignment on physics measurements will be discussed.

Summary

Introduction
The LHC is a proton-proton collider located at the CERN laboratory in Geneva, Switzerland. After many years of commissioning, the LHC managed to circulate the first proton beams during September 2008. It is expected that end of the year 2009 the LHC will collide proton beams at an unprecedented 10 TeV center of mass energy. ATLAS is a general-purpose experiment that will record the LHC collisions in search for new physics phenomena.
In order to achieve its scientific goals, ATLAS is equipped among others with a very precise tracking system (the Inner Detector). The ATLAS Inner Detector consists of about 6000 modules in its Silicon Tracker combined with several hundred drift tube based detector modules. The silicon modules use both technologies: pixel and microstrip. Pixel modules determine the position of passing particle tracks with an accuracy ˜10 microns, whilst microstrip modules accuracy is about 20 microns. The drift tube based detector modules resolution is ˜130 microns. However, the position of the devices after construction is only known much less accuracy than the intrinsic resolution. Therefore a track based alignment procedure has to be applied to determine the absolute position of the sensitive devices to a better precision.
The goal is to align the modules with such precision that the track parameters determination is not worsened by more than a 20% with respect to those derived with the intrinsic tracker resolution.

Therefore position precision required for physics measurements is ˜10 microns.

Method
The position of the detector modules is determined iteratively by a $\chi 2$ minimization of track residuals together with a minimization of track parameters. The determination of the alignment constants is closely related to the solution of a system with a large number of degrees of freedom. In the case of the ATLAS Inner Detector one has about 36000 degrees of freedom. Several types of events can be used in order to add robustness to the alignment and avoid systematic biases. Therefore the collision data is being combined with cosmic ray as well as beam-gas events. There is also a Frequency Scan Interferometer (FSI), which is a hardware system that monitors the distance of a 3D grid of points mounted the semiconductor tracker supporting structure. It can be run on short periods (every 10 minutes). In this way one can account for short-term deformations. Its information may be also feed in to the track based alignment as an additional constraint.
Implementation of the Inner Detector Alignment in the ATLAS computing model
The ATLAS computing model requires the supply of alignment constants within 24 hours after data taking. The constants will then be used for the bulk reconstruction of the data and as input for the triggering of events. This requirement demands a sophisticated solution for the implementation of the alignment infrastructure. There is a PC farm devoted to run the alignment jobs. The input data consists on a dedicated calibration stream of high Pt isolated tracks selected by the ATLAS level 2 trigger. After completion, the alignment constants are uploaded to the Data Base. In order to validate the constants the ATLAS express stream is reconstructed using these constants and physics observables as well as detector performance are monitored. If validation is successful, the ATLAS physics streams will be subsequently reconstructed with the new set of constants.

Current Status
The ATLAS ID alignment group has participated in many data challenges. As a result, the algorithms and computing resources are ready. The alignment challenges have comprised tests with real data (test beams, cosmic ray) and with simulation. The alignment has also been run on the full dress rehearsals of the ATLAS offline, producing and validating constants within 24 h. Large scale simulation was performed with a distorted geometry and the alignment algorithm proved its capability to find and correct the distortions. More sophisticated tests are being performed using weak modes. The weak modes are deformations of the tracking system that leave the track $\chi 2$ almost invariant whilst track parameters are wrongly measured. Geometries with weak modes are also being investigated from the alignment point of view and from their impact on physics observables.
Currently, the ATLAS detector is operational and cosmic rays are being collected with the real detector. These data have been used to align the Inner Detector. In this way alignment constants have been obtained and the detector calibrated, and its performance studied. The ATLAS Inner Detector is thus ready to reconstruct the LHC collisions.

Authors: Dr SCHIECK, Jochen (MPI-Munich); MARTI I GARCIA, Salvador (IFIC-Valencia (UV-CSIC))

Presenter: GORFINE, Grant (Bergische Universitaet Wuppertal)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **161** Type: **not specified**

Large Angle Beamstrahlung at CESR

Tuesday 28 July 2009 15:00 (30 minutes)

Results from extended operation of the CESR Large Angle Beamstrahlung Monitor are presented.

Author: BONVICINI, giovanni (Wayne State University)

Presenter: BONVICINI, giovanni (Wayne State University)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **162** Type: **not specified**

Analysis of Dˆ0 D-barˆ0 piˆ0 Decays of the X(3872)

Tuesday 28 July 2009 15:00 (25 minutes)

In most recent analyses of Dˆ0 D-barˆ0 piˆ0 decays of the X(3872), these events were assumed to come from Dˆ{*0} D-barˆ0 or Dˆ0 D-barˆ{*0} followed by the decay of the Dˆ{*0} or D-barˆ{*0}. Given this assumption, every Dˆ0 D-barˆ0 piˆ0 event near the Dˆ{*0} D-barˆ0 threshold is assigned an invariant mass above the threshold. Such an analysis necessarily yields a mass for the X(3872) that is above the Dˆ{*0} D-barˆ0 threshold. We carry out an analysis of the recent Dˆ0 D-barˆ0 piˆ0 data from the Babar and Belle Collaborations that takes into account this effect as well as the universal features of an S-wave threshold resonance. Our best fits give a mass for the X(3872) that is below the Dˆ{*0} D-barˆ0 threshold and consistent with the mass obtained from analyses of the J/psi piˆ+ piˆ- decay channel. Our analysis demonstrates that the same narrow resonance below the Dˆ{*0} D-barˆ0 threshold is responsible for the J/psi piˆ+ piˆ- and Dˆ0 D-barˆ0 piˆ0 events. It reinforces the identification of the X(3872) as an extremely weakly-bound charm meson molecule.

Author: BRAATEN, Eric (Ohio State University)

Co-author: STAPLETON, James (Ohio State University)

Presenter: BRAATEN, Eric (Ohio State University)

Session Classification: Hadron Spectroscopy I

Track Classification: Hadron Spectroscopy

Contribution ID: **163** Type: **not specified**

Prospects for Measuring the Cosmic-Ray Proton Spectrum Using the LAT Instrument on the Fermi Gamma-Ray Space Telescope

Monday 27 July 2009 15:40 (20 minutes)

The Fermi Gamma-Ray Space Telescope was launched in June 2008 and the onboard Large Area Telescope (LAT) has been collecting data since August of that same year. The LAT is currently being used to study a wide range of science topics in high-energy astrophysics, one of which is the study of high-energy cosmic rays. The LAT has recently demonstrated its ability to measure cosmic-ray electrons, and the Fermi LAT Collaboration has published a measurement of the high-energy cosmic-ray electron spectrum in the 20 GeV to 1 TeV energy range. This talk will discuss the prospects for using the LAT to perform a similar analysis to measure cosmic-ray proton events. The instrument response for cosmic-ray protons will be characterized and an assessment of the potential to measure the cosmic-ray proton energy spectrum will be presented.

Authors: Prof. WINER, Brian (The Ohio State University and The Fermi LAT Collaboration); Mr SMITH, Patrick (The Ohio State University and The Fermi LAT Collaboration); Prof. HUGHES, Richard (The Ohio State University and The Fermi LAT Collaboration)

Presenter: Mr SMITH, Patrick (The Ohio State University and The Fermi LAT Collaboration)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **164** Type: **not specified**

Search for Anisotropy in the Flux of Cosmic Rays Using the LAT Instrument on the Fermi Gamma-Ray Space Telescope

Monday 27 July 2009 15:15 (25 minutes)

Designed as a high-sensitivity gamma-ray observatory, the Fermi Large Area Telescope (LAT) can also identify high-energy cosmic ray electrons and protons with angular resolution of better than one degree above 50 GeV. The statistics of such samples are quite large, with several million identified protons and electrons in 10 months of data. We discuss the prospects for measuring anisotropies in the arrival directions of cosmic rays identified by the LAT in the first year in orbit.

Authors: Prof. WINER, Brian (The Ohio State University and The Fermi LAT Collaboration); Mr SMITH, Patrick (The Ohio State University and The Fermi LAT Collaboration); Prof. HUGHES, Richard (The Ohio State University and The Fermi LAT Collaboration)

Presenter: Prof. HUGHES, Richard (The Ohio State University and The Fermi LAT Collaboration)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **165** Type: **not specified**

Top quark pair cross section prospects in ATLAS

Tuesday 28 July 2009 15:10 (25 minutes)

The observation of the top quark will be an important milestone in ATLAS. This talk reviews methods that ATLAS plans to use to observe the top quark pair production process and measure its cross section.

Author: GAPONENKO, Andrei (Lawrence Berkeley National Laboratory)

Presenter: GAPONENKO, Andrei (Lawrence Berkeley National Laboratory)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **167** Type: **not specified**

The Nuclear Emulsion Technology and the Analysis of the OPERA Experiment Data

Tuesday 28 July 2009 16:30 (15 minutes)

OPERA is an experiment that aims at detecting the appearance of tau-neutrinos in an almost pure muon-neutrinos beam through oscillation. The CC tau-neutrino interaction is identified through the detection of the tau lepton decay topology in the so-called Emulsion Cloud Chambers (ECC), passive lead sheets constituting the target mass interleaved with nuclear emulsion films providing the high spatial resolution. We mainly report here on the analysis of the emulsion films data.

This analysis is performed in two main steps: locating the neutrino interaction and searching for a secondary vertex topology of which kinematics is compatible with that of tau decay. We first describe the system developed and currently used for the location of the neutrino interactions and summarize the status of the analysis. We introduce the method used to search for decay vertex topologies. We then explain how the ECC technology is further used to perform kinematic measurements and particle identification that complements the information provided by the electronic detector. Finally, we show some special events, including charm decay candidates, observed during the physics run.

Author: Mr FUKUDA, Tsutomu (Nagoya university (JAPAN))

Presenter: Mr FUKUDA, Tsutomu (Nagoya university (JAPAN))

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **168** Type: **not specified**

Viscous Evolution of a Quark Gluon Plasma

Thursday 30 July 2009 16:45 (30 minutes)

This work investigates the consequence of the non-equilibrium phase space distribution on elliptic flow and particle spectra using a viscous hydrodynamic simulation. First, we show how various models of energy loss lead to different viscous corrections to spectra and make a connection between the shear viscosity coefficient and the transport parameter q-hat. The off-equilibrium distribution function is taken from leading order pQCD calculations which yields different corrections for quarks and gluons. Finally, we study a meson/baryon system with different viscous corrections due to the particles' different mean free paths. This leads to an alternative description of the experimentally observed quark number scaling.

Author: DUSLING, Kevin (Brookhaven National Laboratory)

Co-authors: TEANEY, Derek (Stony Brook University); MOORE, Guy (McGill University)

Presenter: DUSLING, Kevin (Brookhaven National Laboratory)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **169** Type: **not specified**

Analysis of Neutral Current Interactions in MINOS: A Search for Sterile Neutrinos

Monday 27 July 2009 17:30 (15 minutes)

A search for disappearance of active neutrinos over a baseline of 735 km was conducted using the NuMI neutrino beam and the MINOS detectors. The data analyzed correspond to an exposure of 3.18x10ˆ20 protons-on-target.
The data are fitted to neutrino oscillation models in which mixing with one sterile neutrino is assumed. A comparison of the neutral-current-like spectrum at the far detector with the expectation derived from the near detector measurement shows that the fraction of disappearing muon neutrinos converting to a sterile state is less than 52% at the 90% confidence level. In addition, the possibility of decay of active neutrinos into sterile species occurring concurrently with neutrino oscillations was analyzed. Pure neutrino decay is disfavored at 5.4σ as an alternate explanation to oscillations for the depletion of muon neutrinos at 735 km.
In this talk, the methodology employed in the analysis of neutral current neutrino events observed in MINOS is described and newly obtained results are presented.

Author: Dr SOUSA, Alexandre (Harvard University)

Presenter: Dr SOUSA, Alexandre (Harvard University)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **170** Type: **not specified**

The COUPP Dark Matter Search Experiment

Tuesday 28 July 2009 14:20 (20 minutes)

The COUPP collaboration* has revived the bubble chamber technique for use in WIMP dark matter search experiments. The first engineering run, which resulted in improved limits on spin-dependent WIMP-proton couplings, were reported in 2008
using a two kg target. Since then improvements including radiopurification efforts, cosmic ray vetos, design and construction of larger scale chambers (4kg, 20 kg and 60 kg), have been made which will allow the experiment to approach the forefront of
sensitivity in the spin independent sector within the next year. This talk will focus on the developments since the first publication.

*http://www-coupp.fnal.gov/

Author: Prof. LEVINE, Ilan (Indiana University South Bend)

Presenter: Prof. LEVINE, Ilan (Indiana University South Bend)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **171** Type: **not specified**

Reconstruction of high transverse momentum top quarks at CMS

Monday 27 July 2009 14:55 (15 minutes)

High mass resonance decaying into ttbar pairs appear in many extensions of the Standard Model. The top quarks from these decays have high transverse momentum and their decay products are typically bunched together due to the boost into the lab frame. As a result the standard techniques for reconstructing ttbar events begin to fail. In this talk we will discuss the prospects for detecting booted top quarks at CMS.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: GIURGIU, Gavril (Johns Hopkins)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **172** Type: **not specified**

Precision Measurement of the Low Energy Solar Neutrino Spectrum with the LENS Experiment

Thursday 30 July 2009 15:20 (15 minutes)

Mark Pitt, Virginia Tech, on behalf of the LENS Collaboration

The Low-Energy Neutrino Spectroscopy (LENS) experiment is designed to precisely measure in real time
the spectral flux of the low energy solar neutrinos (pp, ^{7}Be, pep, and CNO, comprising > 99% of the solar neutrino flux)
via charged-current capture on indium-115 (with a threshold of 114 keV). LENS will allow a comparison of the neutrino
and photon luminosities of the sun that will test the basic assumptions of solar astrophysics and the overall validity of the MSW-LMA neutrino model.
The individual flux results will improve limits on θ_{12} and the pp spectrum can directly probe the temperature profile of fusion energy production.
To adequately suppress the dominant background (indium beta decay), a detector technology utilizing a novel optical segmentation method with indium-loaded
liquid scintillator has been developed. A modest 1˜m^3 prototype detector (miniLENS), in development for installation in the Kimballton Underground
Research Facility (KURF), will validate the expected performance and allow for optimization of the full scale ˜ 200 ton LENS experiment. The detector
design and simulation, liquid-loaded scintillator studies, and detector development work will be discussed.

Author: PITT, Mark (Virginia Tech)

Presenter: PITT, Mark (Virginia Tech)

Session Classification: Neutrino Physics III

Track Classification: Neutrino Physics

Contribution ID: **173** Type: **not specified**

The Search for Neutrinoless Double Beta Decay in CUORE

Friday 31 July 2009 14:50 (15 minutes)

Understanding the nature of neutrino masses will require physics beyond the long-standing Standard Model of particle physics. Neutrinoless double beta decay (0νββ) experiments like the Cryogenic Underground Observatory for Rare Events (CUORE) are uniquely suited for probing the remaining mysteries of neutrino mass, particularly the question of the neutrino's Majorana nature. CUORE will be a next-generation experiment at Gran Sasso National Laboratory in Italy; it will consist of an array of 988 TeO2 detector crystals operated at 10 mK, following the bolometric technique established by the Cuoricino experiment. It will look for the energy signal produced by the theoretically-predicted 0νββ decay in 130Te, and therefore reliable energy calibration of the detector is crucial to the experiment's success. We will present the most recent results from Cuoricino and discuss the current status of the CUORE project, with a particular emphasis on the development of the calibration system.

Author: EJZAK, Larissa (University of Wisconsin-Madison)

Presenter: EJZAK, Larissa (University of Wisconsin-Madison)

Session Classification: Neutrino Physics IV

Track Classification: Neutrino Physics

Contribution ID: **174** Type: **not specified**

A light-cone wavefunction approach to open heavy flavor dynamics in a QGP

Tuesday 28 July 2009 14:00 (25 minutes)

We calculate the charm and beauty parton distribution functions and fragmentation functions for open heavy mesons in vacuum using their operator definitions in factorized perturbative QCD and find leading corrections that arise from the structure of the final-state hadrons. Using thermal potentials calculated on the lattice we demonstrate the existence of open heavy flavor bound state solutions in the QGP in the vicinity of the critical temperature and provide first results for the in-medium modification of the heavy quark distribution and decay probabilities for mesons in equilibrium with a thermal plasma. In an improved perturbative QCD description of heavy flavor dynamics in the thermal medium we combine D and B meson formation and dissociation with parton-level charm and beauty quark quenching to obtain predictions for the heavy meson and non-photonic electron suppression in Cu+Cu and Pb+Pb collisions
at RHIC and the LHC, respectively.

Summary

The early production of heavy quarks makes them some of the most important probes of the QGP formed in relativistic heavy ion collisions. Furthermore, direct measurements of the spectra of charm and beauty hadrons will soon become available with the vertex detector upgrades at RHIC, and at the LHC. In this talk, I will discuss our results for the open charm and beauty spectra observed in heavy ion collisions.

It is well known that suppression of the non-photonic electrons from open heavy mesons observed at RHIC can not be explained by purely partonic energy loss of the heavy quarks. It was shown by Adil and Vitev, that the non-perturbative process of fragmentation inside the thermal medium and subsequent dissociation can lead to a larger suppression of the non-photonic electrons, giving better agreement with data. We perform a detailed calculation of heavy meson suppression, combining the partonic level energy loss with the dissociation mechanism, and include systematically all known cold nuclear matter effects. We also consider the modifications of the fragmentation functions and the parton distribution functions for open heavy mesons in equilibrium with the medium, and see how this affects the suppression.

Looking ahead, we give predictions for the differential distributions and multiplicities of charm and beauty hadrons at the LHC.

Author: SHARMA, Rishi (LANL)

Co-authors: ZHANG, Benwei (LANL); VITEV, Ivan (LANL)

Presenter: SHARMA, Rishi (LANL)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **175** Type: **not specified**

Neutrino Oscillations: Atmospheric and Solar

Monday 27 July 2009 14:30 (25 minutes)

In contrast to the predictions of the Standard Model of particle physics, experimental data now indicate that neutrinos are massive and undergo flavor oscillations. Indeed, the oscillations of ν_e to ν_x within the sun are now the favored explanation for the discrepancy between the Standard Solar Model's electron neutrino flux prediction and the flux measurements of the solar neutrino experiments. Similarly, observations of atmospheric neutrinos have confirmed that ν_μ to ν_τ oscillations explain the atmospheric neutrino anomaly. These data form an increasingly complete framework of neutrino oscillations and define two oscillation domains driven by largely different frequencies and large mixing angles. Though it remains to be seen whether or not the domains are also connected by the third as yet unmeasured mixing angle, θ_{13}, there are additional open questions that can be addressed by continued study of neutrinos from these natural sources. In this talk I will review the current state of solar and atmospheric neutrino oscillation physics.

Author: WENDELL, Roger (Duke University)

Presenter: WENDELL, Roger (Duke University)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **176** Type: **not specified**

Search for theta_13 at Daya Bay

Tuesday 28 July 2009 18:10 (15 minutes)

Search for θ_{13}, the last unknown mixing angle is extreamly important in understanding the lepton flavor mixing matrix, and investigation of the CP violation in the lepton sector. The reactor neutrino experiments can provide a clean laboratory for the θ_{13} measurement via electron antineutrino disappearance.
The Daya Bay experiment proposes to measure $\sin^2 2\theta_{13}$ with a sensitivity better than 0.01 (90% C.L) in three year run at the Daya Bay reactor power plant in China. In this talk I will present the physics prospects and sensitivity of our experiment.

Author: Dr MOHAPATRA, Debabrata (Virginia Polytechnic Institute & State University)

Presenter: Dr MOHAPATRA, Debabrata (Virginia Polytechnic Institute & State University)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **177** Type: **not specified**

A theory of jet shapes and cross sections in hadronic and nuclear collisions

Friday 31 July 2009 15:25 (35 minutes)

For jets, with great power comes great opportunity. The unprecedented center of mass energies available at the LHC open new windows on the QGP: we demonstrate that jet shape and jet cross section measurements become feasible as a new, differential and accurate test of the underlying QCD theory. We present a first step in understanding these shapes and cross sections in heavy ion reactions. Our approach allows for detailed simulations of the experimental acceptance/cuts that help isolate jets in such high-multiplicity environment. It is demonstrated for the first time that the pattern of stimulated gluon emission can be correlated with a variable quenching of the jet rates and provide an approximately model-independent approach to determining the characteristics of the medium-induced bremsstrahlung spectrum. Surprisingly, in realistic simulations of parton propagation through the QGP we find a minimal increase in the mean jet radius even for large jet attenuation. Jet broadening is manifest in the tails of the energy distribution away from the jet axis and its quantification requires high statistics measurements that will be possible at the LHC. I will also review recent jet measurements at RHIC in light of the emerging theory.

Author: Dr VITEV, Ivan (LANL)

Presenter: Dr VITEV, Ivan (LANL)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **178** Type: **not specified**

Search for Higgs in NMSSM and Hidden Valley models

Tuesday 28 July 2009 14:35 (20 minutes)

We report on a first search for production of Higgs bosons decaying into neutral long-lived particles (NLLP) which each decay to a bbbar pair, using 3.6 fbˆ-1 of data recorded with the D0 detector at the Fermilab Tevatron collider. We search for pairs of displaced vertices in the tracking detector at radii in the range 1.6–20 cm from the beam axis. No significant excess is observed above background, and upper limits are set on the production rate in a hidden-valley benchmark model for a range of Higgs boson masses and NLLP masses and lifetimes.

We report on a first search for production of the lightest neutral CP-even
Higgs boson (h) in the next-to-minimal
supersymmetric standard model, where h decays to a pair of neutral
pseudoscalar Higgs bosons (a), using 4.2/fb of data
recorded with the D0 detector at Fermilab. The a bosons are required to
either both decay to muˆ+muˆ- or one to
muˆ+muˆ- and the other to tauˆ+tauˆ-. No significant signal is observed, and we set limits on its production as functions of M_a and M_h.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Dr HAAS, Andy (SLAC)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **184** Type: **not specified**

Measurement of Dijet Angular Distributions and Search for New Physics with the D0 Detector

Thursday 30 July 2009 17:10 (25 minutes)

We present the first measurement of dijet angular distributions in Run II of the Fermilab Tevatron Collider. The measurement is based on a dataset, corresponding to an integrated luminosity of approx 0.7 fb-1 taken with the D0 detector. Shapes of dijet angular distributions have been measured over a range of dijet masses, from 0.25 TeV and beyond 1TeV. The data are in good agreement with the predictions of perturbative QCD and are used to constrain new physics models including quark compositeness, large extra dimensions, and TeV-1 scale extra dimensions.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: Dr LINCOLN, Don (Fermilab)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **185** Type: **not specified**

Recent results from Y(5S) at Belle

Tuesday 28 July 2009 15:12 (24 minutes)

We report recent results on B_s decays, including measurements of $J/\psi\eta(')$ and several other modes. The results are based on large data sample collected at the $\Upsilon(5S)$ resonance with the Belle detector at the KEKB asymmetric e^+e^- collider.

Author: Dr LI, Jin (University of Hawaii)

Presenter: Dr LI, Jin (University of Hawaii)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **187** Type: **not specified**

Measurement of Differential Z/gamma+jet+X Cross Sections with the D0 Detector

Thursday 30 July 2009 17:35 (25 minutes)

We present measurements of differential cross sections in inclusive Z/gamma plus jet production in a data sample of 1fb-1 collected with the D0 detector in proton antiproton collisions at sqrt(s)=1.96TeV. Measured variables include the Z/gamma transverse momentum (pT-Z), and rapidity (y-Z), the leading jet pT (pT-jet), and rapidity (y-jet), as well as various angles of the Z+jet system. We compare the results to different Monte Carlo event generators and to next-to-leading order perturbative QCD (NLO pQCD) predictions, with non-perturbative corrections applied.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: LAMMERS, Sabine (Indiana University)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **189** Type: **not specified**

Photons plus Heavy Flavors and Double Parton Interactions in Photon plus Three-jet events in ppbar collisions at sqrt(s)=1.96 TeV in the D0 experiment

Thursday 30 July 2009 16:45 (25 minutes)

A sample of photon plus 3-jet events collected in the D0 experiment with an integrated luminosity of 1fb-1 is used to determine the fraction of the events with double parton (DP) scattering fDP in a single ppbar collision at sqrt(s)=1.96TeV. The events are selected with photon candidate transverse momentum between 60 and 80GeV, leading jet pT above 25GeV and two additional jets with pT above 15GeV. The values of fDP are measured in three intervals of the second jet transverse momentum pT2 between 15 and 30GeV. We found that the fDP fractions drop with increasing pT2. In the same three pT2 intervals, we also calculate an effective cross section sigma_eff, a process-independent parameter which contains information about the parton densities in the proton and represents possible parton correlations. The value obtained from averaging over the three pT2 intervals is sigma_eff= 15.12 +- 1.87 mb.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: BANDURIN, Dmitry (Kansas State University)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **190** Type: **not specified**

Search for Charginos and Neutralinos with the D0 detector; Search for dark photons from supersymmetric hidden valleys with the D0 Detector

Monday 27 July 2009 17:10 (20 minutes)

Supersymmetry predicts the existence of charginos and neutralinos, the partners of the gauge and Higgs bosons, which can be produced in pairs at the Tevatron. Charginos and neutralinos decay directly or in cascades into charged leptons and the lightest supersymmetric particle (LSP). Assuming R parity conservation the LSP (in this case the lightest neutralino) is stable. Due to the small background from Standard Model processes, a final state with three leptons and missing transverse energy is considered an excellent channel at the Tevatron. In this presentation results from four different channels (e+e+l, mu+mu+l, e+mu+l and mu+tau+l) will be presented. The results of the individual analyses, based on a data set corresponding to an integrated luminosity of 2.3 fb-1, are combined and interpreted in the context of the mSUGRA model. The final exclusion limit in the m0-m1/2 plane, extending well beyond existing limits, will be presented.
For some sets of parameters in the mSUGRA parameter space, the third lepton may be very soft and a like sign leptons signature has been developed to deal with such a topology.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: ADAMS, Todd (Department of Physics, B-159 - Florida State University)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **192** Type: **not specified**

Searches for Squarks and Gluinos with the D0 Detector

Monday 27 July 2009 17:30 (20 minutes)

A search for squarks and gluinos has been performed on data from ppbar collisions collected using the D0 detector at the Fermilab Tevatron. The topology analyzed consists of jets with large missing transverse energy. The search for squarks has also been performed in the topology of multijet events accompanied by large missing transverse energy and at least one tau lepton decaying hadronically.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: UZUNYAN, Sergey (Northern llinois University)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **194** Type: **not specified**

Model Independent Search for New Physics in Leptonic Final States with the D0 Detector

Thursday 30 July 2009 14:40 (20 minutes)

We present the results of a broad search for indications of new physics at the electroweak scale. We examine an exposure of 1 fb-1 to pbar p interactions at the Fermilab Tevatron at sqrt(s)=1.96 TeV collected by the D0 detector. We concentrate on final states involving leptons, but the searches are done in a model independent way. We analyze the data for deviations from the predictions of the standard model, rather than focusing on specific new-physics predictions of alternative models.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: LINNEMANN, James (Michigan State University)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **195** Type: **not specified**

Search for Leptoquark Production with the D0 Detector

Friday 31 July 2009 14:40 (20 minutes)

We report on searches for the production of scalar and vector leptoquarks in ppbar collisions at the Tevatron collider, which are based on integrated luminosities of up to 2.5 fb-1 collected with the DO detector. Leptoquarks, which are predicted by several extensions of the Standard Model, are hypothetical particles carrying both lepton and quark flavors. At hadron colliders they can either be pair-produced via the strong interaction or a single leptoquark can be produced in association with a lepton via the hypothesized leptoquark-lepton-quark coupling. Searches for the pair-production of leptoquarks of all generations have been performed using several final states. A search for the single production of leptoquarks coupling to muons will also be presented. Upper limits on the production cross sections are given and are used to derive lower limits on the leptoquark masses as a function of the branching fraction beta of the leptoquark in a charged lepton and a quark and for different couplings.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: UZUNYAN, Sergey (Northern llinois University)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **197** Type: **not specified**

Search for the Higgs Boson in H->WW and WH to WWW(*) with the D0 Detector

Tuesday 28 July 2009 16:30 (20 minutes)

We present a search for the Standard Model Higgs boson produced via the WH to WWW(*) process at a center-of-mass energy of sqrt{s}=1.96 TeV with the D0 detector at the Fermilab Tevatron collider. We require two like-sign leptons (electrons or muons) with about 5 fb-1 of data. This channel provides significant sensitivity in the intermediate Higgs boson mass range. As well as inclusion of the full data set, about 5 fb-1, recent improvements to the sensitivity will be discussed.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Dr KIRBY, Michael (Northwestern University)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **201** Type: **not specified**

Search for Excess Dimuon Production in the Radial Region 1.6<r<10 cm at the D0 Experiment

We report on a study of events containing at least two muons produced in ppbar collisions at sqrt{s}=1.96 TeV, performed at the D0 experiment using data corresponding to 0.9 fb-1 of integrated luminosity collected during 2008. Motivated by a recent claim of an excess in muons produced at large radius by the CDF collaboration, we study muons that appear to be produced with a radius between 1.6 and 10 cm from the initial pbbar collision point. The experimenta signature is a well reconstructed muon that is missing hits in the innermost layer of the tracking detector. We record 28374 muons that appear to be produced without hits in the first layer of the tracking detector. Based on the measured hit efficiency, we epect 27 662 pm 503 pm 1027 muons from the primary interaction to not have a reconstructed hit in this layer. This gives an observed excess of 712 pm 462 pm 942 events in which one or both muons are produced in the range 1.6 < r < 10 cm, which is expressed as a fraction (0.40 pm 0.26 pm0.53)\% of the total dimuon sample. A small level of excess is expected due to cosmic rays, decays-in-flight of pions and kaons, and hadronic punchthrough, and first estimates of these contributions are made. We therefore see no anomalously large excess of muons produced a few centimeters away from the interaction point.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Beyond the Standard Model

Contribution ID: **204** Type: **not specified**

Evidence for the Decay Bs to Ds(*) Ds(*) and a Measurement of DeltaGamma(CP)_s/Gamma_s

Tuesday 28 July 2009 16:54 (24 minutes)

We search for the semi-inclusive process Bs to Ds(*)Ds(*) using 2.8 fb-1 of ppbar collisions at sqrt{s}=1.96 TeV recorded by the D0 detector operating at the Fermilab Tevatron Collider. We observe 26.6 pm 8.4 signal events with a significance above background of 3.2 standard deviations yielding a branching ratio of 0.035 pm 0.010 (stat) pm 0.011(syst). Under certain theoretical assumptions, these double-charm final states saturate CP-even eigenstates in the Bs decays resulting in a width difference of DeltaGamma(CP)_s/Gamma_s = 0.072 pm 0.021 (stat) pm 0.022 (syst).

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: YOUN, Sung Woo (Northwestern U./Fermilab)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **206** Type: **not specified**

Observation of the Doubly Strange b Baryon Omega-_b with the D0 Detector

We report the first observation of the doubly strange b baryon Omega-_b in the decay channel Omega-_b to J/psi Omega-, with J/psi to mu+ mu- and Omega- to Lambda K- to (p pi-)K- in ppbar collisions at sqrt{s} = 1.96 TeV. Using approximately 1.3 fb-1 of data collected with the D0 detector at the Fermilab Tevatron Collider, we observe a signal with 5.4 sigma.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Hadron Spectroscopy

Contribution ID: **207** Type: **not specified**

Measurement of the W Boson Mass and Width with 1 fb-1 of D0 Run II Data

Tuesday 28 July 2009 14:30 (20 minutes)

We present the most precise single measurement of the W boson mass and and a measurement of the W width using data collected with the D0 experiment. An integrated luminosity of 1 fb-1 yields 499,830 W->evcandidates. The mass is measured with an uncertainty of less than 45 MeV while the width uncertainty is less than 75 MeV.

Author: OSTA, Jyotsna (Notre Dame)

Presenter: OSTA, Jyotsna (Notre Dame)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **211** Type: **not specified**

Measurement of the Forward-backward Charge Asymmetry in Z/gamma*->ee events with the D0 Detector

Friday 31 July 2009 14:40 (20 minutes)

We present a measurement of the forward-backward charge asymmetry (AFB) for di-electron produced via an intermediate Z/gamma*$ boson using about 3.6 fb-1 of data. These data were collected by the D0 detector in ppbar collisions at sqrt{s}=1.96 TeV. We also present a measurement of the effective weak mixing angle using the measured AFB distribution.

Author: HOANG, Trang (Florida State University)

Presenter: HOANG, Trang (Florida State University)

Session Classification: Electroweak Physics III

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **212** Type: **not specified**

Measurements of the Trilinear Gauge Boson Couplings from Diboson Production at D0

Thursday 30 July 2009 14:20 (20 minutes)

We present the first observation of the Zgamma to nunugamma process at the Tevatron at 5.1 standard deviations significance, based on 3.6 fb-1 of integrated luminosity collected with the D0 detector at the Fermilab Tevatron ppbar Collider at sqrt{s} = 1.96 TeV. The measured Zgamma cross section multiplied by the branching fraction of Z to nunu is 32 +- 9 (stat.+syst.) +- 2 (lumi.) fb for the photon ET > 90 GeV. It is in agreement with the standard model prediction of 39 +- 4 fb. We set the most restrictive limits on anomalous trilinear Zgammagamma and ZZgamma gauge boson couplings at a hadron collider to date, with three constraints being the world's strongest.

Author: SEKARIC, Jadranka (Florida State University)

Presenter: SEKARIC, Jadranka (Florida State University)

Session Classification: Electroweak Physics II

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **213** Type: **not specified**

High Statistics Measurement of Di-boson Production with the D0 Detector

Thursday 30 July 2009 14:00 (20 minutes)

We present high statistics measurements of diboson production in ppbar collisions at the D0 experiment in multiple channels, including WW -> lvlv, WW/Z-> lvjj and WZ->lvll. These measurements both test physics beyond the standard model and demonstrate the sensitivity of hadron colliders to rare signals such as Higgs boson production.

Author: STRANG, Mike (Ohio State University)

Presenter: STRANG, Mike (Ohio State University)

Session Classification: Electroweak Physics II

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **214** Type: **not specified**

Combined Limits on Anomalous Couplings at the DO experiment

We present the direct measurement of trilinear gauge boson couplings in the WW+WZ ->lvjj final state using proton-anti-proton collisions at sqrt{s}=1.96 TeV. Analysed data correspond to 1.07 fb-1 of integrated luminosity collected with the D0 detector at the Fermilab Tevatron. The 95 % C.L. limits are set using two different relation between the anomalous Z and gamma exchange terms in WW/WZ production. In addition we combine the result from the lvjj final state with other D0 results from fully leptonic final states in Wgamma, WW and WZ production.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **220** Type: **not specified**

Measurement of the Wtb Coupling and the W Boson Helicity in Top Quark Decays with the D0 Detector

We present the simultaneous measurement of the ratio of branching fractions, R=B(t -> Wb)/B(t -> Wq), with q being a d, s, or b quark, and the top quark pair production cross section sigma(ttbar) in the lepton plus jets channel using data at sqrt(s)=1.96 TeV collected with the D0 detector. We extract R and sigma(ttbar) by analyzing samples of events with 0, 1 and >2 identified b jets.

We also report on a model-independent measurement of the helicity of W bosons produced in top quark decays based on a 4 fb-1 sample of ttbar events in the dilepton and lepton+jets channels.
W boson helicity fractions are sensitive to the ratios of different anomalous Wtb couplings as well as single top production.
We set simultaneous limits on left-handed vector and right-handed vector, and left-handed vector and right-handed tensor Wtb couplings measured using the single top selection.
We combined this analysis with the W boson helicity measurement to set direct upper limits on a right-handed vector coupling as well as a left-handed tensor coupling.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **221** Type: **not specified**

Search for Charged Massive Long-Lived Particles Using Data from D0

Tuesday 28 July 2009 17:10 (20 minutes)

We report on a new search for charged massive stable particles (CMSPs) at the D0 Experiment at the Fermilab Tevatron collider. These electrically charged particles have sufficiently long lifetimes to penetrate through the entire D0 detector before decaying. CMSPs are predicted in many theories beyond the Standard Model. We use time-of-flight information to search for pair-produced CMSPs, based on the signature of two particles, reconstructed as muons, with speed and invariant mass inconsistent with beam-produced muons. The analysis uses data taken by the DO detector in Run II.

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: XIE, Yunhe (Brown University)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **222** Type: **not specified**

Searches for quark compositeness/heavy resonances in hadronic final states

Friday 31 July 2009 15:20 (20 minutes)

We report on searches for a compositeness signature of quarks and leptons in the di-fermion (di-leptons and di-jets) channels using data collected by the D0 detector at the Fermilab Tevatron. We set model-dependent lower limits at the 95% condence level on the compositeness scale of for constructive and destructive interference between the Drell-Yan (DY) amplitude and the contact interaction for various quark and lepton chiralities.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: SMIRNOV, Dmitri (Notre Dame)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **223** Type: **not specified**

Search for New Phenomena in final states with leptons, photons, MEt

Tuesday 28 July 2009 17:30 (20 minutes)

The high-mass spectrum of lepton and photon pairs is sensitive to a broad array of new physics. Examples are searches for extra dimensions in different models in the dielectron, dimuon, and diphoton channels, photon + missing transverse energy and Z' bosons with Standard-Model-like couplings to fermions as well as in a variety of GUT-inspired models. In addition, the data sample can be searched for a W' boson. We report on the latest results in those searches obtained by the D0 experiment at the Tevatron.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: KATSANOS, Ioannis (University of Nebraska - Lincoln)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **224** Type: **not specified**

Search for Hidden Valleys Signatures with the D0 Detector

We present results of searches for unique experimental signatures that might arise from a hidden sector extension (hidden valley) of the standard model. Reduced couplings to the hidden sector can result in long-lived particle decays that result in highly displaced vertices from di-leptons or di-jets. By searching for such signatures, D0 extends its discovery potential into previously unexplored phase space.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Beyond the Standard Model

Contribution ID: **225** Type: **not specified**

Search for Supersymmetric Higgs Bosons

Thursday 30 July 2009 16:35 (20 minutes)

We report on a search for charged Higgs bosons in the mass range 80 < m_H+ < 155 GeV in decays of top quark pairs in ppbar collisions at sqrt{s}=1.96 TeV. It has been performed using ˜1 fb-1 of data collected with the D0 detector at the Fermilab Tevatron collider. The search is based on the analysis of ttbar production rates in the final states with two isolated leptons (electrons or muons) and jets, one isolated lepton (electron or muon) and jets and isolated lepton (electron or muon) and tau decaying hadronically. We find no evidence for signal. The results are interpreted within a tauonic Higgs model where the charged Higgs is assumed to decay exclusively to taunu and in a leptophobic model where the charged Higgs is assumed to decay exclusively to csbar. We set upper limits on the branching fractions B(t -> H+ b -> taubar neutrino b)) and B(t -> H+ b -> c sbar b)) for low charged-Higgs masses.

We also use ratios of ttbar cross sections in different final states to set upper limits on those branching fractions.

Furthermore, we describe a search for quark fusion production qq' –> H+ of the charged Higgs boson reconstructed in the tb final state for a mass range 180 < m_H+ < 300 GeV. We find no evidence for heavy charged Higgs production and set limits on the production cross-section for a variety of theoretical models.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Prof. RITZADINOVA, Flera (Oklahoma State University)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **227** Type: **not specified**

Measurement of the Forward-Backward Charge Asymmetry in Top-Antitop Production with the D0 Detector

We present a measurement of the integrated forward-backward charge asymmetry in top-antitop quark pair (ttbar) production in proton-antiproton collisions in the lepton plus jets final state. Using a b-jet tagging algorithm and kinematic reconstruction assuming ttbar+X production and decay, data collected by the D0 experiment at the Fermilab Tevatron Collider is used to measure the asymmetry for different jet multiplicities. The result is also used to set upper limits on ttbar+X production via a Z' resonance.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **228** Type: **not specified**

Search for Anomalous Top Quark Couplings with the D0 Detector

Anomalous Wtb couplings modify the angular correlations of the top quark decay products and change the single top quark production cross section. We present limits on anomalous top quark couplings by combining information from W boson helicity measurements in top quark decays and anomalous coupling searches in the single top quark final state. We set limits on right-handed vector couplings as well as left-handed and right-handed tensor couplings based on data collected by the D0 experiment.

Authors: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenters: JUSTE, Aurelio (Fermilab); WAHL, H (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **239** Type: **not specified**

First observation of NuMI anti-neutrinos by MINOS

Monday 27 July 2009 17:10 (15 minutes)

The MINOS long-baseline neutrino experiment has confirmed the disappearance of accelerator muon-neutrinos and measured the $|\Delta m^2_{23}|$ mass splitting with the best precision to date. The MINOS experiment is now set to measure the disappearance of muon anti-neutrinos and their oscillation parameters, which can be used to test CPT violation and other exotic models. The magnetic field of the detectors is utilized to separate muon neutrinos and anti-neutrinos event-by-event by identifying the charge sign of the muon created in charged current interactions. We report the first direct observation of muon anti-neutrinos in the MINOS far detector in the current muon-neutrino dominated beam and the constraint the data place on the $\sin^2\bar{\theta}_{23}$ and $|\Delta\bar{m}^2_{23}|$ parameters. We will also discuss the prospect of the measurement when the polarity of the magnetic focusing horns will be reversed this Fall to create a dedicated muon anti-neutrino beam.

Author: Dr DANKO, Istvan (University of Pittsburgh)

Presenter: Dr DANKO, Istvan (University of Pittsburgh)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **240** Type: **not specified**

RADIATION-HARD ASICS FOR SLHC OPTICAL DATA TRANSMISSION

Thursday 30 July 2009 16:15 (25 minutes)

We have designed several ASICs for the optical link upgrades of the new silicon trackers of the ATLAS experiment at the planned upgrades of the LHC, CERN. The ASICs include a high-speed driver for VCSELs, a receiver/decoder for the signal received at the PIN diode, and a clock multiplier to produce a higher frequency clock to serialize the data for transmission. These chips were designed using a 130 nm CMOS process to enhance the radiation-hardness. We irradiated the chips with 24 GeV/c protons at CERN to the SLHC dosage of 70 Mrad, including a 50% safety factor. We observed no significant degradation except in the VCSEL driver. Post-irradiation analysis indicates that there is a significant threshold shift in the PMOS transistors fabricated in the thick oxide technology for the operation at 2.5 V to drive the VCSEL. We also studied the single event upset (SEU) rate of the receiver and clock multiplier. We will present the results of the study.

Summary

High-speed data transmission in a high radiation environment poses an immense challenge in the detector design. We investigate the feasibility of using optical links for the silicon trackers of the ATLAS experiment for the planned upgrade of the LHC. The planned upgrade with ten times higher collision rate will produce a similar increase in the radiation. One possibility for the optical transmission is to use VCSEL arrays operating at 850 nm to transmit optical signals while using PIN arrays to convert the optical signals into electrical signals.

We have designed a prototype chip containing building blocks for future SLHC optical links using a 130 nm CMOS 8RF process. The chip contains four main blocks; a VCSEL driver optimized for operation at 640 Mb/s, a VCSEL driver optimized for 3.2 Gb/s, a PIN receiver with a clock/data recovery circuit for operation at 40, 160, and 320 Mb/s, and two clock multipliers designed to operate at 640 Mb/s. The clock multiplier is designed to produce the high speed clock to serialize the data for transmission. All circuitry was designed following test results and guidelines from CERN on radiation tolerant design for the process.

We have irradiated the chips with 24 GeV protons at CERN. For the VDC, the duty cycle of the output signal and the current consumption of the LVDS receiver remained constant during the irradiation. However, we observed significant decreases in the current consumption of the VCSEL driver circuit and the output drive current. This indicated that the think oxide layout used in the VCSEL driver portion of the chip might not be as radiation-hard and the circuit had been redesigned to minimize this sensitivity. For the PIN receiver, we found that the radiation produced no significant degradation, including the single event upset rate. The upset rate decreased with larger PIN current and was higher for a chip coupled to a PIN diode as expected. For the clock multipliers, we observed that the clocks of some chips lost lock during the irradiation and power cycling was needed to resume operation at 640 MHz. We will present the results from the detailed characterization of the irradiated chips.

Author: Prof. GAN, K.K. (The Ohio State University)

Presenter: Prof. GAN, K.K. (The Ohio State University)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **241** Type: **not specified**

Bjorken hydrodynamics from an AdS Schwarzschild black hole

Friday 31 July 2009 15:00 (20 minutes)

We discuss the derivation of dissipative Bjorken hydrodynamics from a Schwarzschild black hole in asymptotically AdS spacetime of arbitrary dimension in the limit of large longitudinal proper time τ. Using an appropriate slicing near the boundary, we calculate the Schwarzschild metric to next-to-next-to-leading order in the large τ expansion as well as the dual stress-energy tensor on the boundary via holographic renormalization. At next-to-next-to-leading order, it is necessary to perturb the Schwarzschild metric in order to maintain boost invariance. The perturbation has a power law time dependence and leads to the same value of the ratio of viscosity to entropy density, $1/(4\pi)$, as in the case of sinusoidal perturbations. Our results are in agreement with known time-dependent asymptotic solutions of the Einstein equations in five dimensions.

Author: Mr ALSUP, James (University of Tennessee)

Co-author: Prof. SIOPSIS, George (University of Tennessee)

Presenter: Mr ALSUP, James (University of Tennessee)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **242** Type: **not specified**

STUDY OF THE RADIATION-HARDNESS OF VCSEL/PIN ARRAYS

Thursday 30 July 2009 16:40 (25 minutes)

We investigate the feasibility of using VCSEL and PIN for the optical links at the silicon trackers of the ATLAS experiment at the planned upgrades of the LHC, CERN. We irradiated VCSEL and PIN with 24 GeV/c protons at CERN up to the equivalent SLHC fluence of 2.6 x 10ˆ15 p/cm2, including a 50% safety factor. The GaAs VCSEL arrays were fabricated by Optowell and Advanced Optical Component (AOC). The latter vendor fabricates arrays with two different bandwidths, 5 and 10 Gb/s. The GaAs PIN arrays are fabricated by Optowell, AOC, ULM Photonics, and Hamamatsu. The silicon PINs were fabricated by Taiwan and Hamamatsu. The optical power of VCSEL arrays decreases significantly after the irradiation but can be partially annealed with high drive currents. The responsivities of the GaAs PIN arrays decrease by 40-90% after irradiation. As expected, for the silicon PIN diodes, the degradation in the responsivities is smaller, 15-45%. However, it should be noted that the bandwidth of the silicon PIN diodes is somewhat smaller. Overall, most of the degradations are acceptable and hence we have identified candidate VCSELs and PINs for the SLHC applications.

Summary

Optical links are now widely used in high energy physics experiments for data transmission. The links substantially reduce the volume of metallic signal cables freeing up valuable detector space. In addition, the fibers eliminate the cross talk between metallic cables and electrical ground loops between the front-end electronics and the data acquisition system. The high bandwidth of opto-electronics is well suited for multiplexing many input channels and allows for introduction of error checking and error recovery transmission protocols. These features are especially important in experiments where radiation can induce Single Event Effects (SEE) in the digital electronics. The silicon trackers of the ATLAS experiment at the LHC use VCSELs to generate the optical signals at 850 nm and PIN diodes to convert the signals back into electrical signals for further processing. The devices have been proven to be radiation-hard for operation at the LHC.

The LHC will start operation in 2009. However, an upgrade of the collider, Super LHC, is already being planned for 2016. The SLHC is designed to increase the luminosity of the LHC by a factor of ten to 10ˆ35 cm-2s-1. Accordingly, both the required data bandwidth and radiation-hardness of the detector are expected to increase by a similar factor. We use the Non Ionizing Energy Loss (NIEL) scaling hypothesis to estimate the SLHC fluences at the present optical link location (PP0) of the ATLAS pixel detector. The estimate is based on the assumption that the main radiation effect is bulk damage in the VCSEL and PIN with the displacement of atoms. After five years of operation at SLHC (3,000 fb-1), we expect a silicon device to be exposed to a maximum total fluence of 1.5 x 10ˆ15 1-MeV neq/cm2. The corresponding fluence for a GaAs component (VCSEL) is 8.2 x 10ˆ15 1-MeV neq/cm2. We study the response of the optical link to a high dose of 24 GeV protons. The expected equivalent fluences at SLHC are 2.6 and 1.6 x 10ˆ15 p/cm2, respectively.

We packaged the PIN and VCSEL at OSU for the irradiation. The VCSEL arrays were mounted on a shuttle to allow the VCSEL arrays to be moved out of the beam for periodic annealing. The VCSEL arrays irradiated include two from Optowell and one 5 and one 10 Gb/s array from AOC. The optical power decreased during the irradiation as expected. We annealed the arrays by moving the arrays out of the beam and passing the maximum allowable current (˜ 10 mA per channel) through the arrays for several hours each day. The optical power increased during the annealing. Unfortunately, there was insufficient time for a complete annealing but the AOC arrays still have

good optical power at the SLHC dosage. However, the situation is less clear with the Optowell device because of an intermittent connectivity problem. We believe the Optowell arrays will have good optical power when we characterize them in the lab after the radiation cool down.

For the PIN diodes, we irradiated two GaAs arrays from AOC, Optowell, ULM Photonics, and Hamamatsu. We irradiated the arrays from the first three vendors in 2007. The devices were powered but we did not monitor the responsivities online. The responsivities decreased up to 90%. This year we monitored the responsivities online by illuminating the devices with light from VCSELs and measuring the PIN current. The responsivities decrease by 40-90%, with Optowell and Hamamatsu having the highest responsivities after the irradiation.
In addition to the GaAs PIN diodes, we also irradiated silicon PINs, two Taiwan arrays and eleven single-channel silicon diodes from Hamamatsu (five S5973 and six S9055). The decrease in the responsivities is smaller, 15-45%, with S5973 having the highest responsivities after the irradiation. The degradation is consistent with the expectation that a silicon device is more radiation-hard than a GaAs device. However, it should be noted that the bandwidth of the silicon PIN diodes is somewhat smaller.

In summary, we identify the several VCSEL and PIN candidates for the SLHC applications. The results of the study will be presented at the conference.

Author: FERNANDO, Waruna (The Ohio State University)

Presenter: FERNANDO, Waruna (The Ohio State University)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **243** Type: **not specified**

Long-baseline neutrino experiments as tests for Lorentz violation

Tuesday 28 July 2009 15:20 (15 minutes)

Lorentz symmetry is a key feature of our best description of nature. Among the different tests of this fundamental symmetry are ones with neutrino oscillations, which can provide a sensitive measurement of suppressed signals of new physics. The talk describes the neutrino sector of the Standard-Model Extension, which represents a general modification of the standard neutrino massive model to
include Lorentz and CPT violation. Attainable sensitivities to coefficients for Lorentz violation are estimated for existing and future long-baseline neutrino experiments.

Author: DIAZ, Jorge S. (Indiana University)

Co-authors: MEWES, Matthew (Swarthmore College); KOSTELECKY, V. Alan (Indiana University)

Presenter: DIAZ, Jorge S. (Indiana University)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **244** Type: **not specified**

Perturbative QCD for hadron collider physics: progress and applications

Thursday 30 July 2009 14:00 (35 minutes)

I will describe recent developments in perturbative QCD focusing on progress in understanding one-loop corrections to multi-jet processes.

Author: Mr MELNIKOV, Kirill (Johns Hopkins University)

Presenter: Mr MELNIKOV, Kirill (Johns Hopkins University)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **245** Type: **not specified**

Equation of State and the finite temperature transition for hot QCD

Thursday 30 July 2009 14:45 (30 minutes)

This talk will summarize the results obtained by the HotQCD collaboration on the equation of state and the crossover transition in 2+1 flavor QCD. We will present results on bulk thermodynamic quantities - energy density, pressure, entropy density, and the speed of sound over the temperature range 140 < T < 540 MeV. These results have been obtained on lattices of temporal size $N_\tau = 6$ and 8 and with two improved staggered fermion actions, asqtad and p4. Our most extensive results are with masses of the two degenerate light quarks set at $m_{ud} = 0.1m_s$ corresponding to the lightest pion mass m_π between 220-260 MeV. In these simulations, the strange quark mass is tuned to its physical value and defines lines of constant physics. We will also summarize the current state of results on observables sensitive to the chiral and deconfining physics - the light and strange quark number susceptibilities, the chiral condensate and its susceptibility, and the renormalized Polyakov loop. Our results indicate that the deconfinement and chiral symmetry restoration occur in the same narrow temperature interval.

Author: GUPTA, Rajan (Los Alamos National Lab)

Presenter: GUPTA, Rajan (Los Alamos National Lab)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **246** Type: **not specified**

Muon Collider Progress and Prospects

Tuesday 28 July 2009 14:30 (30 minutes)

Inventions and synergies with global and national goals are rapidly improving the prospects for a high luminosity muon collider at the energy frontier. Analytical calculations, numerical simulations, and experimental measurements are coming together to make a strong case for a series of machines to be built, where each one is a precursor to the next, with its own unique experimental and accelerator physics programs. The ultimate machine is an energy-frontier muon collider. In about 4 years, the LHC and Tevatron will tell us the desired energy of the next lepton collider. At that time we must understand the needed technology and be ready to design, cost, and build the appropriate muon collider.

Author: JOHNSON, Rolland (Muons, Inc.)

Presenter: JOHNSON, Rolland (Muons, Inc.)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **247** Type: **not specified**

Search for Phi(1862) Pentaquark States with CLAS

Thursday 30 July 2009 14:00 (25 minutes)

Following the first observations of the possible $S = +1$ pentaquark state $\Theta^+(1540)$, there have been many experiments in various laboratories to verify these results and to search for states which could be associated with other members of the pentaquark antidecuplet. The NA49 collaboration reported the observation of narrow $S = -2$ states with masses about $1860\tilde{}$GeV showing in the $\Xi\pi$ invariant mass spectra.
These states were identified as isospin $3/2$ members of the pentaquark antidecuplet, and were named $\Phi(1862)$. However, other experiments have failed to reproduce these results.
A dedicated experiment has recently been performed at Jefferson Lab using the CLAS detector to search for the $\Phi(1862)$ state in photoproduction on a deuterium target. A large data sample has been collected and analyzed containing approximately two thousand $\pi^-\Xi^-$ candidates. The preliminary results of the experiment will be presented and discussed.

Author: Dr EGIYAN, Hovanes (CLAS Collaboration)

Presenter: Dr EGIYAN, Hovanes (CLAS Collaboration)

Session Classification: Hadron Spectroscopy II

Track Classification: Hadron Spectroscopy

Contribution ID: **248** Type: **not specified**

ATLAS sensitivity to leptoquarks and heavy Majorana neutrinos in final states with high-pt dileptons and jets with early LHC data

Friday 31 July 2009 15:00 (20 minutes)

Dilepton-jet final states are used to study physical phenomena not predicted by the standard model. ATLAS discovery potential to leptoquarks and Majorana neutrinos is presented with fully-simulated ATLAS detector at the Large Hadron Collider (LHC) at
CERN. The study is motivated by the role of the leptoquark in the Grand Unification of fundamental forces and the see-saw mechanism that explains the masses of the observed neutrinos. The analysis algorithms are presented, background sources are discussed and the estimates of sensitivity and discovery potential to these processes are reported.

Author: Mr BANSAL, Vikas (Department of Physics and Astronomy-University of Pittsburgh-Unk)

Presenter: Mr BANSAL, Vikas (Department of Physics and Astronomy-University of Pittsburgh-Unk)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **249** Type: **not specified**

Massive Quark Scattering at Strong Coupling from AdS/CFT

Friday 31 July 2009 14:40 (20 minutes)

We extend the analysis of Alday and Maldacena for obtaining gluon scattering amplitudes at strong coupling to include massive quark scattering. Our quarks are actually the N=2 hypermultiplets which arise when D7-brane probes are included in the AdS_5 x Sˆ5 geometry. We first derive appropriate massive-particle boundary conditions for the string scattering worldsheets. We then find an exact worldsheet which corresponds to the scattering of two massive quarks and two massless gluons and extract from this the leading order IR divergence for this amplitude. We also find a worldsheet for the scattering of four massive quarks in the limit of small quark mass. Our worldsheet solutions reduce to the four massless gluon solution of Alday and Maldacena in the limit of zero quark mass, suggesting that the string worldsheets associated with scattering amplitudes at strong coupling have a universal behavior in the sense that they depend solely on kinematics.

Authors: VAMAN, Diana (University of Virginia); BARNES, Edwin (University of Virginia)

Presenter: BARNES, Edwin (University of Virginia)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **250** Type: **not specified**

Bridging the soft and the hard at RHIC: collective flow, jet quenching and medium response.

Friday 31 July 2009 14:50 (35 minutes)

Measurements from RHIC at intermediate p_T of 2-6 GeV/c revealed many features in various single particle and two particle correlation observables. These measurements not only suggest the leading roles of collective flow and jets in this p_T region, but also establish a strong and sophisticated coupling between the two. Experimental results are discussed in the hope to elucidate the connections between the soft and the hard processes.

Author: Dr JIA, Jiangyong (Brookhaven National Laboratory (BNL) and Stony Brook University)

Presenter: Dr JIA, Jiangyong (Brookhaven National Laboratory (BNL) and Stony Brook University)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **251** Type: **not specified**

Search for standard model Higgs in WH->lnubb channel

Monday 27 July 2009 15:00 (20 minutes)

We present a search for the Standard Model Higgs boson produced in association with a W boson in p-pbar collisions at a center-of-mass energy of sqrt(s) = 1.96 TeV. The search is performed in the WH->lnubb channel using the latest amount of data collected by the CDF detector at the Fermilab Tevatron. An artificial neural network is employed to improve the separation between signal and background. Additional techniques used to improve the Higgs sensitivity include the use of optimized b-quark jet energy corrections and improved algorithms for identifying b-quarks. In the absence of an observed excess in data, an upper limit is set on the production rate times branching ratio for the Higgs.

Presenter: Dr PRICE, Darren (Indiana University)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **253** Type: **not specified**

Search for standard model Higgs in ZH->llbb production channel

Monday 27 July 2009 14:35 (20 minutes)

We present a search for associated production of a standard model (SM) Higgs boson and a Z boson where the Z decays to two leptons and the Higgs decays into a pair of b quarks, p-pbar->ZH->llbb. We explore techniques not currently used in other Higgs searches at CDF. We utilize SM matrix elements to calculate event probabilities rather than utilizing them as a discriminant variable. Using these probabilities we construct a likelihood function of the Higgs content of the data sample, rather than the standard template approach, and then extract a limit from the sample using a technique that guarantees exact coverage. In 2.7 fb-1 of CDF data we see no evidence of the production of a Higgs boson with a mass between 100 GeV/cˆ2 and 150 GeV/cˆ2. We set 95% C.L. upper limits on the cross-section for ZH production as a function of the Higgs boson mass (m_H); the limit is 7.8 times the SM prediction at m_H = 115 GeV/cˆ2.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Mr SHALHOUT, Zaki (Wayne State University)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **254** Type: **not specified**

Search for standard model Higgs in VH->nunubb (V = W or Z) channel

Monday 27 July 2009 15:25 (20 minutes)

We present a search for the Standard Model Higgs boson produced in association with a Z or a W boson in p-pbar collisions at a center-of-mass energy of sqrt(s) = 1.96 TeV. The search is made using the latest amount of data collected by the CDF detector at the Fermilab Tevatron. We consider the scenario where the Higgs boson decays into a b-bbar pair and either the Z decays into neutrinos or the lepton originating from the W-decay escapes detection, leading to an expected signature of two b-jets, no leptons, and missing transverse energy. A data-driven model of the QCD jet background and the advanced analysis techniques used to increase the search sensitivity are also presented.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Dr JAYATILAKA, Bodhitha (Duke University)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **255** Type: **not specified**

Higgs searches in final states with tau leptons

Monday 27 July 2009 16:30 (20 minutes)

We present a search for the standard model Higgs boson in events with two tau leptons in p-pbar collisions at a center-of-mass energy of sqrt(s) = 1.96 TeV. The search is made using the latest amount of data collected by the CDF detector at the Fermilab Tevatron. We search in the final state of two tau leptons plus two jets. This final state is sensitive to WH and ZH where one boson decays to two jets, the other to two tau leptons, but also sensitive to vector boson fusion production of Higgs boson and gluon fusion processes, with a Higgs decaying to two tau leptons, plus two jets in the final state. We use a multivariate discriminant to distinguish Higgs signal from backgrounds, and set limits on standard model Higgs production.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Dr CHAKRABARTY, Subhendu (SUNY Stony Brook)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **256** Type: **not specified**

Search for Higgs boson in H->gamma gamma channel

Monday 27 July 2009 16:55 (20 minutes)

We present a search for a fermiophobic Higgs decaying to two photons. In the standard model the Higgs boson decays predominately to two bottom quarks for low Higgs masses, and the branching ratio for decays to two photons is on the order of 0.2%. However, in scenarios, where the Higgs boson only couples with other bosons,
H to two photon decays are much more significant. Since the Higgs in this model does not couple to fermions, the production modes relevant to this search are associated Higgs production and vector boson fusion. The search is performed by looking for a peak in the diphoton mass spectrum. In the absence of an observed peak, we set upper limits on the cross section times branching ratio for fermiophobic Higgs production with subsequent decay to two photons.

Authors: JUSTE, Aurelio (Fermilab); Dr JAMES, Eric (Fermi National Accelerator Lab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester); TBA

Presenter: Mr BU, Xuebing (Univ of Science and Technology of China, Hefei)

Session Classification: Higgs Physics I

Track Classification: Higgs Physics

Contribution ID: **257** Type: **not specified**

Search for a supersymmetric Higgs boson decaying to tau leptons

Thursday 30 July 2009 15:25 (20 minutes)

We present searches for non-standard model Higgs boson production using the latest amount of data collected by the CDF detector at the Fermilab Tevatron. Supersymmetric extensions of the standard model can yield enhanced production of a neutral MSSM Higgs boson, A, according to the parameter tan(Beta). We search for an A decaying to tau leptons, and set exclusion regions in the tan(Beta) versus m_A MSSM parameter space.

Author: TBA

Presenter: Prof. CONWAY, John (University of California, Davis)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **259** Type: **not specified**

Search for standard model Higgs boson in H->WW channel at CDF

Tuesday 28 July 2009 16:55 (20 minutes)

We present a search for standard model (SM) Higgs to WW production in dilepton plus missing transverse energy final states using approximately 5.0 fb-1 of integrated luminosity. In order to maximize sensitivity, the multivariate discriminants used to separate signal from background in the opposite-sign dilepton event sample have been independently optimized for final states with either zero, one, or two or more identified jets. All significant Higgs boson production modes (gluon fusion, associated production with either a W or Z boson, and vector boson fusion) are considered in determining potential signal contributions. We also incorporate a separate analysis of the same sign dilepton event sample which can potentially contain additional signal events originating from the associated Higgs boson production mechanisms. Cross section limits relative to the combined SM prediction are presented for a range of different Higgs mass hypothesis between 110 and 200 GeV/cˆ2.

Authors: Dr JAMES, Eric (Fermi National Accelerator Lab); TBA

Presenter: Dr PURSLEY, Jennifer (University of Wisconsin)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **261** Type: **not specified**

Prospects for Upgrade of KEKB

Friday 31 July 2009 15:15 (25 minutes)

The Belle detector at the KEKB electron-positron collider has collected nearly 1˜ab^{-1} of data in its decade of operation. The KEKB group has proposed Super-KEKB, an upgrade of KEKB to increase the luminosity by two orders of magnitude during a three-year shutdown, with an ultimate goal of 8 x 10ˆ35/cmˆ2/s luminosity. To exploit the improved luminosity, an upgrade of the Belle detector has been proposed. A new international collaboration Belle-II, is being formed. Super-KEKB and Belle-II were officially placed on the KEK 5-year Roadmap in early 2008.

Author: Prof. KINOSHITA, Kay (University of Cincinnati)

Presenter: Prof. KINOSHITA, Kay (University of Cincinnati)

Session Classification: Detectors II

Track Classification: Detector Technology and R&D

Contribution ID: **262** Type: **not specified**

Combined upper limit on standard model Higgs boson production at the Tevatron

Tuesday 28 July 2009 17:20 (20 minutes)

A combination of several searches for standard model Higgs boson production at CDF using data samples up to 5fb-1 of integrated luminosity is performed. We calculate combined upper limits on the ratio of the Higgs boson cross section times branching ratio to its standard model prediction for Higgs boson masses between 100 GeV/cˆ2 and 200 GeV/cˆ2.

Authors: Dr JAMES, Eric (Fermi National Accelerator Lab); TBA

Presenter: Dr KRUMNACK, Nils (Baylor University)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **263** Type: **not specified**

Renormalon subtraction from the average plaquette and the gluon condensate

Friday 31 July 2009 15:15 (25 minutes)

We show that the Borel resummed perturbative contribution of the stochastic perturbation theory and dimension-4 gluon condenstate can acccount for the average plaquette data, and the resulting gluon condensate of the SU(3) pure Yang-Mills theory is determined to be $\langle \frac{\alpha_s}{\pi} GG \rangle \approx 0.13 \text{ GeV}^4$.
A critical review of the existing procedure of renormalon subtraction is presented.

Author: LEE, Taekoon (Kunsan National University)

Presenter: LEE, Taekoon (Kunsan National University)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **264** Type: **not specified**

On the absence of spin-orbit inversion in heavy-light mesons

Thursday 30 July 2009 14:25 (25 minutes)

It is shown that the absence of the long-time potential model prediction of spin-orbit inversion in heavy-light
mesons can be explained by the chiral radiative
corrections in potential model. Some consequences of the radiative
corrections on the spectrum of P-wave bottom mesons are discussed.

Author: LEE, Taekoon (Kunsan National University)

Co-author: Mr LEE, Ianwoo (Kunsan National Univ)

Presenter: LEE, Taekoon (Kunsan National University)

Session Classification: Hadron Spectroscopy II

Track Classification: Hadron Spectroscopy

Contribution ID: **265** Type: **not specified**

Study of D+(s) decay properties at Belle

Thursday 30 July 2009 14:48 (20 minutes)

We study the decay properties of the D_sˆ+ using a large data sample collected by the Belle detector at the KEKB asymmetric energy e^+e^- collider. Measurements of the relative branching fractions of K_S pi and K_S K
states and the observation of the doubly Cabibbo-suppressed decay Ds+ -> K+K+pi- are presented.

Authors: Dr KO, Byeongrok (Korea University); Prof. WON, Eunil (Korea University); Mr LEE, Soohyung (Korea University)

Presenter: Mr LEE, Soohyung (Korea University)

Session Classification: Heavy Flavor Physics III

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **266** Type: **not specified**

Light Hidden Fermionic Dark Matter In Neutrino Experiments

Friday 31 July 2009 14:45 (25 minutes)

We study, in a model-independent analysis, the possibility of direct detection of light fermionic dark matter in neutrino experiments. We consider all operators of dimension six or lower which can contribute to the process f p -> n e+, where f is a dark fermion, and place constraints on their coefficients via the dark matter lifetime. We then discuss limits on these interactions from neutrino experiments.

Authors: Dr SONI, Amarjit (Brookhaven National Lab); Dr KILE, Jennifer (Brookhaven National Lab)

Presenter: Dr KILE, Jennifer (Brookhaven National Lab)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **267** Type: **not specified**

MICE Overview

Monday 27 July 2009 14:30 (30 minutes)

Muon ionization cooling provides the only practical solution to prepare high brilliance beams necessary for a neutrino factory or muon colliders.
The muon ionization cooling experiment (MICE)* is under development at the Rutherford Appleton Laboratory (UK). It comprises a dedicated beam line to generate a range of input emittance and momentum, with time-of-flight and Cherenkov detectors to ensure a pure muon beam. A first measurement of emittance is performed in the upstream magnetic spectrometer with a scintillating fiber tracker. A cooling cell will then follow, alternating energy loss in liquid hydrogen and RF acceleration. A second spectrometer identical to the first one and a particle identification system provide a measurement of the outgoing emittance. In July 2009 it is expected that the beam and some detectors will be in the final commissioning phase and the time of the first measurement of input beam emittance only months away. The plan of steps of measurements of emittance and cooling, that will follow in the rest of 2009 and later, will be reported.

Author: Dr CONEY, Linda (UC Riverside)

Presenter: Dr CONEY, Linda (UC Riverside)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **268** Type: **not specified**

Search for fourth generation quarks with CMS

The new energy regime that becomes accessible at the LHC will allow to extend the search region for 4th generation of quarks and leptons beyond existing constraints. Two studies covering both the low-mass and high-mass b' search regions are performed. Using leading order cross section for b' production, we determine the significance expected for an observation at up to 1/fb data at $\sqrt{s} = 10$ TeV. In the absence of a discovery, 95\% confidence level exclusion limits are presented as well.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Track Classification: Beyond the Standard Model

Contribution ID: **269** Type: **not specified**

ATLAS Silicon Microstrip Tracker Operation

Thursday 30 July 2009 14:00 (25 minutes)

The ATLAS experiment at the CERN Large Hadron Collider (LHC) has started taking data last autumn with the inauguration of the LHC. The SemiConductor Tracker (SCT) is the key precision tracking device in ATLAS, made up from silicon micro-strip detectors.
The completed SCT has been installed inside the ATLAS experimental hall. Since then the detector was operated for many months under realistic conditions. Calibration data has been taken and analysed to determine the noise performance of the system. In addition, extensive commissioning with cosmic ray events has been performed both with and without magnetic field. Efficiency and noise determination for various bias voltages was also performed.
The current status of the SCT will be reviewed, including results from this year's latest data-taking periods, and from the detector alignment. The SCT commissioning and running experience will then be used to extract valuable lessons for future silicon strip detector projects.

Summary

The ATLAS experiment at the CERN Large Hadron Collider (LHC) has started taking data last autumn with the inauguration of the LHC. The SemiConductor Tracker (SCT) is the key precision tracking device in ATLAS, made up from silicon micro-strip detectors processed in the planar p-in-n technology.
The completed SCT has been installed inside the ATLAS experimental hall. Since then the detector was operated for many months under realistic conditions. Calibration data has been taken and analysed to determine the noise performance of the system. In addition, extensive commissioning with cosmic ray events has been performed both with and without magnetic field. The cosmic muon data has been used to align the detector, to check the timing of the front-end electronics as well as to measure the hit efficiency of modules. The sensor behaviour in magnetic field was studied by measurements of the Lorentz angle. For the initial running with unfocussed LHC beam operation with undepleted sensors is foreseen. Efficiency and noise determination for various bias voltages was also performed.
The current status of the SCT will be reviewed, including results from this year's latest data-taking periods, and from the detector alignment. We will report on the commissioning of the detector, including overviews on services, connectivity and observed problems. The SCT commissioning and running experience will then be used to extract valuable lessons for future silicon strip detector projects.

Author: Dr DOLEZAL, Zdenek (Institute of Particle and Nuclear Physics)

Presenter: Dr DOLEZAL, Zdenek (Institute of Particle and Nuclear Physics)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **270** Type: **not specified**

Search for New Physics in rare processes in the B meson systems by LHCb

Thursday 30 July 2009 17:10 (20 minutes)

The LHCb experiment will in the first run of LHC obtain more B-meson decays than has been recorded by any other experiment previously. This provides a unique opportunity for studying very rare decays where the effects of physics beyond the Standard Model might be dominating. The decay Bs -> mu+ mu- is very sensitive to an extended Higgs sector and might be the first place to see the effects of New Physics in data from the LHC. We will present the details of the planned analysis and show that an upper limit for the branching ratio can be set right down to the SM prediction with the data expected in the first run. The decays Bs -> phi gamma and Bd -> K*0 mu+ mu- are flavour changing neutral current decays that cannot happen at the tree level. Through the virtual particles in the box and penguin diagrams responsible for the decays, they are sensitive to new particles well into the TeV mass range. The first results on B -> K(*) l+ l- decays from the e+e- B-factories provide some tantalising hints for physics beyond the Standard Model. We will show how LHCb will be able to increase the precision of these measurements by a large factor and thus would be able to provide a clear signature of New Physics from rare decays.

Author: PEPE-ALTARELLI, Monica (CERN)

Presenter: BETTLER, Marc-Olivier (Laboratoire de Physique des Hautes Energies (LPHE-IPEP))

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **271** Type: **not specified**

Searching for New Physics in CP-violation measurements at LHCb

Thursday 30 July 2009 14:30 (30 minutes)

LHCb is an experiment which has been designed to make precise measurements of CP violating quantities in B-hadron decays. The scope and experimental challenges of this programme are outlined. Our knowledge of the unitarity triangle will be improved significantly with respect to the present status. In particular, the precision on the angle gamma is expected to improve dramatically. Comparison of processes that are sensitive to new physics and those that are dominated by tree-level measurements will provide stringent tests of the Standard Model. Also of the highest interest will be the first precise measurement of the CP violating phase in Bs-Bsbar oscillations. Here LHCb will achieve the sensitivity necessary to resolve the very small value of this parameter predicted in the Standard Model, and will be able to see any enhancements coming from new physics processes with rather little data. Finally, a programme to search for CP violation in D decays will provide a complementary and powerful method of searching for evidence of physics beyond the Standard Model.

Author: PEPE-ALTARELLI, Monica (CERN)

Presenter: Dr BLUSK, Steven (Syracuse University)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **272** Type: **not specified**

Low energy analysis of nu N –> nu N gamma in the Standard Model

Tuesday 28 July 2009 17:10 (15 minutes)

The production of single photons in low energy (˜1 GeV) neutrino scattering off nucleons is analyzed in the Standard Model. At very low energies, E(nu) « 1 GeV, a simple description of the chiral lagrangian involving baryons and arbitrary SU(2)_L x U(1)_Y gauge fields is developed. Extrapolation of the process into the ˜1-2 GeV region is treated in a simple phenomenological model. Coherent enhancements in compound nuclei are studied. The relevance of single photon events as a background to experimental searches for nu(mu) –> nu(e) is discussed. In particular, single photons are a plausible explanation for excess events observed by the MiniBooNE experiment.

Author: HILL, Richard (University of Chicago)

Presenter: HILL, Richard (University of Chicago)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **273** Type: **not specified**

Overview of the T2K long baseline neutrino oscillation experiment

Monday 27 July 2009 18:10 (15 minutes)

Neutrino oscillations were discovered in solar and atmospheric neutrinos experiments, and have been confirmed by experiments using neutrino beams from accelerators and nuclear reactors. It has been found that there are large mixing angles in the nue to numu and numu to nutau oscillations. The third mixing angle, which parameterizes the mixing between the first and the third family, is constrainted to be small by the CHOOZ experiment results. The T2K experiment is a long baseline neutrino oscillation experiment that uses intense neutrino beam produced at J-PARC and SuperKamiokande detector 295km as the far detector. In this talk, we will give an overview of the experiment.

Author: Mr LE, TRUNG (STONY BROOK UNIVERSITY)

Presenter: Mr LE, TRUNG (STONY BROOK UNIVERSITY)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **274** Type: **not specified**

Higgs Production in the MSSM

Tuesday 28 July 2009 14:00 (30 minutes)

I will review the status of the production of the Minimal Supersymmetric Standard Model (MSSM) Higgs bosons at hadron colliders. The talk will include a brief introduction to the Higgs sector of the MSSM and a summary of the state-of-the-art in the calculations of the radiatively-corrected cross sections. I will also review the current bounds on the MSSM parameter space from searches for MSSM Higgs bosons at the Tevatron and, finally, I will discuss the search strategies for the discovery of MSSM Higgs bosons at the LHC.

Author: Dr JACKSON, Christopher (Argonne National Laboratory)

Presenter: Dr JACKSON, Christopher (Argonne National Laboratory)

Session Classification: Higgs Physics II

Track Classification: Higgs Physics

Contribution ID: **275** Type: **not specified**

Optimal spin-quantization axes for the polarizations of dileptons and quarkonium with large transverse momentum

Friday 31 July 2009 15:40 (25 minutes)

The leading-order parton processes that produce a dilepton with large transverse momentum predict that the transverse polarization should increase with the transverse momentum for almost any choice of the quantization axis for the spin of the virtual photon. The rate of approach to complete transverse polarization depends on the choice of spin quantization axis. We propose axes that optimize that rate of approach. They are determined by the momentum of the dilepton and the direction of the jet that provides most of the balancing transverse momentum. This method also is applied to the polarization of quarkonium.

Author: KANG, Daekyoung (The Ohio State University)

Co-authors: YU, Chaehyun (Korea University); BRAATEN, Eric (The Ohio State University); LEE, Jungil (Korea University)

Presenter: KANG, Daekyoung (The Ohio State University)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **276** Type: **not specified**

ATLAS Great Lakes Tier-2 Computing and Muon Calibration Center Commissioning

Monday 27 July 2009 15:30 (25 minutes)

Large-scale computing in ATLAS is based on a grid-linked system of tiered computing centers. The ATLAS Great Lakes Tier-2 came online in Sept., 2006 and now is commissioning with full capacity to provide significant computing power and services to the USATLAS community. Our Tier-2 Center also hosts the Michigan Muon Calibration Center which is responsible for daily calibrations of the ATLAS Monitored Drift Tubes for ATLAS endcap muon system. During the first LHC beam period in 2008 and following the ATLAS global cosmic ray data taking period, the Calibration Center received a large data stream from the muon detector to derive the drift tube timing offsets and time-to-space functions with a turn-around time of 24 hours. We will present the Calibration Center commissioning status and our plan for the first LHC beam collisions in 2009.

Authors: COCHRAN JR, James Herbert (Iowa State University); Dr MCKEE, Shawn (University of Michigan)

Presenter: Dr MCKEE, Shawn (University of Michigan)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **278** Type: **not specified**

Discovery potential for GMSB Supersymmetry in ATLAS using the Zphoton+MET and ZZ+MET Final States

Monday 27 July 2009 15:40 (20 minutes)

We have studied the sensitivity of the ATLAS detector for supersymmetric neutralino signals in the Zphoton + transverce missing energy (MET) and ZZ + MET final states in the Gauge Mediation Supersymmetry Breaking (GMSB) model in which the Higgsino-like neutralino is the next-to-lightest supersymmetric particle (NLSP). The neutralino could be pair produced either directly or indirectly and decay to Z or photon, plus a gravitino, the lightest supersymmetric particle (LSP), which would escape from the detector. This study considers the reaction of $\tilde{\chi}_1^0\tilde{\chi}_1^0 \rightarrow Z\gamma\tilde{G}\tilde{G}$ and $\tilde{\chi}_1^0\tilde{\chi}_1^0 \rightarrow ZZ\tilde{G}\tilde{G}$ decays to electron or muon pairs and used fully simulated ATLAS Monte Carlo events both for the signal and background. Based on the GMSB Higgsino-like neutralino model predictions, we expect that for an integrated luminosity of 2 fb^{-1}, ATLAS could detect the GMSB signal from the Higgsino-like neutralino that has a mass of 134 GeV in the Z photon + MET final state with a significance of 5.4σ assuming 35% systematic uncertainty. For the ZZ + MET final state ATLAS could detect the GMSB signal for an integrated luminosity of 30 fb^{-1}, with a significance of 4.2σ assuming 10% systematic uncertainty.

Author: Dr PANIKASHVILI, Natalia (University of Michigan)

Presenter: HARPER, Devin (University of Michigan)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **279** Type: **not specified**

ATLAS Muon Detector Commissioning

Tuesday 28 July 2009 17:20 (25 minutes)

The ATLAS muon spectrometer consists of several major components: Monitored Drift Tubes (MDTs) for precision measurements in the bending plane of the muons, supplemented by Cathode Strip Chambers (CSC) in the high η region; Resistive Plate Chambers (RPCs) and Thin Gap Chambers (TGCs) for trigger and second coordinate measurement in the barrel and endcap regions, respectively; an optical alignment system to track the relative positions of all chambers; and, finally, the world's largest air-core magnetic toroid system. We will describe the status and commissioning of the muon system with cosmic rays and plans for commissioning with early beams.

Authors: Dr DIEHL, Edward (University of Michigan); COCHRAN JR, James Herbert (Iowa State University-Unknown-Unknown)

Presenter: Dr DIEHL, Edward (University of Michigan)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **280** Type: **not specified**

Review of Recent Developments in ATLAS Computing

Monday 27 July 2009 14:30 (30 minutes)

In anticipation of the calibration, performance, and physics activities that will be performed on the LHC first data, the ATLAS experiment is continuously refining elements of its Computing and Analysis Models. We will present an overview of some of recent developments in ATLAS computing, including the current resource estimates for Tier 1 and 2s, issues related to the establishment of Tier 3s, and the current picture of the interplay of ATLAS data formats, organization of physics activities, and roles of the different computing Tiers.

Authors: STRADLING, Alden (UT Arlington); Prof. FARBIN, Amir (University of Texas, Arlington); COCHRAN JR, James Herbert (Iowa State University-Unknown-Unknown)

Presenter: STRADLING, Alden (UT Arlington)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **281** Type: **not specified**

Emerging Computing Technologies in High Energy Physics

Monday 27 July 2009 16:50 (30 minutes)

Although in the early 90s, High Energy Physics (HEP) helped to drive the computing industry by establishing the HTTP protocol and the first web-servers, the long time-scales for planning and building modern HEP experiments has resulted in a generally slow adoption by HEP of emerging computing technologies which rapidly become commonplace in business and other scientific fields. We will review some of the fundamental computing problems in HEP computing and then present the current state and future potential of employing new computing technologies in addressing these problems. Covered topics include Virtualization, General Purpose computing on Graphics Processors (GPGPU), Solid State Disks (SSD), and Cloud Computing.

Authors: FARBIN, Amir (University of Texas, Arlington); COCHRAN JR, James Herbert (Iowa State University-Unknown-Unknown)

Presenter: FARBIN, Amir (University of Texas, Arlington)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **282** Type: **not specified**

Study of Collective Effect in Ionization Cooling

Monday 27 July 2009 15:00 (30 minutes)

In the process of ionization cooling, as a charged particle passes through an absorber, it induces a wake field by polarizing the absorber medium. If the beam density is sufficiently high (as may be the case in certain aggressive cooling approaches), this could result in beam-intensity-dependent effects, which are not taken into account in past and current studies. To understand this effect more accurately and estimate its importance, preliminary studies have been carried out. Results from these studies will be reported.

Author: Dr HUANG, Dazhang (Illinois Institute of Technology)

Co-authors: Dr NG, King Y. (Fermilab); Dr ROBERTS, Thomas J. (Muons Inc.)

Presenter: Dr HUANG, Dazhang (Illinois Institute of Technology)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **284** Type: **not specified**

The Large Synoptic Survey Telescope

Monday 27 July 2009 16:55 (25 minutes)

Recent technological advances have made it possible to carry out deep optical surveys of a large fraction of the visible sky. Such surveys enable a diverse array of astronomical investigations including: the search for small moving objects in the solar system, studies of the assembly history of the Milky Way, the establishment of tight constraints on models of dark energy using a variety of independent techniques and the exploration of the transient sky. The Large Synoptic Survey Telescope (LSST) is the most ambitious project of this kind that has yet been proposed. With an 8.4 m primary mirror, and a 3.2 Gigapixel, 10 square degree camera, LSST will provide nearly an order of magnitude improvement in survey speed over all existing surveys, or those which are currently in development. Over its ten years of operation, LSST will survey 20,000 square degrees of the sky in six optical colors down to the 27th magnitude. At least a thousand distinct images will be acquired of every field, enabling a plethora of statistical investigations for intrinsic variability and for control of systematic uncertainties in deep imaging studies. In this talk some of the science that will be made possible by the construction of LSST, especially dark energy science, and a brief overview of the technical design and current status of the project will be given.

Author: Prof. SHIPSEY, Ian (Purdue University)

Presenter: Prof. SHIPSEY, Ian (Purdue University)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **285** Type: **not specified**

Baryogenesis from the Decays of Exotic Vector-like Squarks

Tuesday 28 July 2009 17:20 (20 minutes)

We show that the baryon asymmetry of the universe can be realized via the out-of-equilibrium decays of TeV scale exotic vector-like squarks. Since baryon number and CP violation will occur in the superpotential, this mechanism is relatively insensitive to the structure of supersymmetry breaking. Examination of the cosmology will lead to restrictions on the reheat temperature of the universe due to tree-level washout processes. We will discuss various phenomenological constraints on the model and potential signals for future experiments including predictions for the LHC. A variation on the TeV scale model allows the exotic squarks to be the messengers of gauge mediated supersymmetry breaking, yielding an overlapping solution to the messenger decay and baryogenesis problems implicit in this class of models.

Authors: Prof. PIERCE, Aaron (University of Michigan); Mr PHALEN, Daniel (University of Michigan); Mr COHEN, Timothy (University of Michigan)

Presenter: Mr COHEN, Timothy (University of Michigan)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **286** Type: **not specified**

Meson Configurations from String Theory

Friday 31 July 2009 14:20 (20 minutes)

The gauge/gravity correspondence has provided an avenue where modern superstring theory can come full circle back to nuclear physics.
For an SU(N) gauge theory, certain low energy configurations of mesons with k quarks and k anti-quarks, have been studies in both the Hamiltonian formulation of Yang-Mills and lattice gauge theories. Utilizing the gauge/gravity correspondence of string theory one can identify geometries that closely correspond to these k-strings in both 2+1 and 3+1 dimensions. We compare the ground state energies and quantum corrections that are calculated from the gauge/gravity correspondence to the results of lattice gauge theories and Hamiltonian dynamics.

Author: STIFFLER, Kory (University of Iowa)

Co-authors: DORAN, Christopher (University of Iowa); PANDO-ZAYAS, Leopoldo (University of Michigan); RODGERS, Vincent (University of Iowa)

Presenter: STIFFLER, Kory (University of Iowa)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **287** Type: **not specified**

Charm mixing and CPV at CDF

Tuesday 28 July 2009 17:18 (24 minutes)

The CDFII detector at the Fermilab Tevatron has now collected more than 5 fb-1 of data, and using an impact parameter trigger has has collected the largest existing samples of D*+ -> D0pi+ , where D0 decays as D0-> h+h- (with h = K or pi). We present updated measurements of decay rates in these channels, which allow precise measurements of CP violation and flavor mixing in the charm sector.

Authors: KULKARNI, Nagesh (Wayne State University); CDF COLLABORATION, The (Various)

Presenter: KULKARNI, Nagesh (Wayne State University)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **288** Type: **not specified**

Properties of weakly-decaying bottom baryons

Tuesday 28 July 2009 16:30 (25 minutes)

Weakly decaying bottom baryons can in principle be clearly reconstructed from their decays into J/psi or other charmed hadrons. However, their properties like lifetimes and branching fractions have long been quoted only as averages over all states, as the only directly observed b-baryon was the Lambda_b. Only in year 2007, the two Tevatron experiments observed the Xi_b, and recently the D0 collaboration observed also the Omega_b. With the growing dataset accumulated by the Tevatron, it is becoming possible to study the properties of the b-baryons in more detail. In this talk we present a study of production and properties of the Xi_b and Omega_b baryons using 4.2 fb-1 of data accumulated by the CDF II experiment.

Author: Dr BEHARI, Satyajit (CDF)

Presenter: Dr BEHARI, Satyajit (CDF)

Session Classification: Hadron Spectroscopy I

Track Classification: Hadron Spectroscopy

Contribution ID: **290** Type: **not specified**

Measurement of Bc properties at CDF

Monday 27 July 2009 14:24 (20 minutes)

The Bc meson, composed of two heavy quarks of distinct flavor, provides a very interesting system to study. CDF experiment is the leading contributor to the experimental studies of Bc mesons, with measurements of both production and decay properties. We report amongst other results the measurement of production cross section and lifetime, using semileptonic Bc -> J/psi mu X decays.

Authors: CDF COLLABORATION, The (Various); NIGMANOV, Turgun (University of Pittsburgh)

Presenter: NIGMANOV, Turgun (University of Pittsburgh)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **291** Type: **not specified**

Heavy quark meson spectroscopy at CDF

Tuesday 28 July 2009 14:35 (25 minutes)

With growing datasets collected by the CDF II experiment, studies of the spectroscopy of mesons containing heavy quarks becomes more exciting. The CDF experiment has good capabilities in both charm and bottom sector. This capability allowed also to contribute to the study of the Zoo of states called X,Y,Z. In this area we present a recent update of the mass measurement of X(3872). The result m(X(3872)) = 3871.61 +- 0.16 +- 0.19 MeV/cˆ2 is currently the most precise measurement in the world. In addition, we report evidence for a new narrow resonance, Y(4140), the first to be seen in the J/psi phi decay mode, using 2.7 fb-1 of exclusive B+->J/psiphiK decays.

Authors: Dr YI, Kai (Physics and Astronomy Department-University of Iowa-Unknown); CDF COLLABORATION, The (Various)

Presenter: Dr YI, Kai (Physics and Astronomy Department-University of Iowa-Unknown)

Session Classification: Hadron Spectroscopy I

Track Classification: Hadron Spectroscopy

Contribution ID: **295** Type: **not specified**

The Fourth Generation in Extensions of the Standard Model

Thursday 30 July 2009 17:30 (20 minutes)

Since the discovery of neutrino mass, the possibility of a fourth generation of particles has reemerged. Electroweak precision measurements force the fourth generation to have non-degenerate masses which is consistent with the three standard generations. We present the possibilities of detecting fourth generation top quark in several theories beyond the Standard Model, including warped extra dimensions and two Higgs doublet models.

Authors: Dr DE PREE, Erin (St. Mary's College of Maryland); Mr MARSHALL, Gardner (The College of William & Mary); Prof. SHER, Marc (The College of William & Mary)

Presenter: Dr DE PREE, Erin (St. Mary's College of Maryland)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **296** Type: **not specified**

Study of CP violation in Bs -> J/psi phi decays at CDF

Tuesday 28 July 2009 14:24 (24 minutes)

The first measurement of CP violation phase beta_s in Bs -> J/psi phi decays in 2007 generated considerable interest. The interest was caused by the small deviation from the SM. While not sufficiently significant, together with other measurements it is suggestive of a possible new physics contribution. In the subsequent update using 2.8 fb-1 of data collected by CDF II detector deviation from the SM further increased. We present latest CDF results on the mean decay width Gamma_s and CP violating phase beta_s, based on an angular- and time-dependent analysis of the Bs -> J/psi phi decays, including determination of the flavor of the Bs meson at production time.

Author: Dr CDF COLLABORATION, The (Various)

Presenter: Dr REDONDO, Ignacio

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **297** Type: **not specified**

Search for a heavy top t'->Wq in top events

Monday 27 July 2009 15:25 (15 minutes)

In the 15 years since the discovery of top at the Tevatron the data available has reached the point where we can perform in depth examinations of the top quark event sample for evidence of physics beyond the Standard Model. We present a search for a massive quark (t') decaying to Wq and thus mimicking the top quark decay signature. We use the reconstructed mass of the t' quark and the scalar sum of the transverse energies in the event to discriminate possible new physics from Standard Model processes, and set limits on a standard 4th generation t' quark.

Author: Mr COX, David (University of California, Davis)

Presenter: Mr COX, David (University of California, Davis)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **298** Type: **not specified**

Mass Dependence of the Forward-Backward Asymmetry in Top Pair Production

Monday 27 July 2009 17:15 (15 minutes)

CDF and D0 have recently reported measurements of the forward-backward asymmetry in top pair production in ppbar collisions at the Tevatron. We report here on a study of that asymmetry as a function of the invariant mass of the ttbar system. A simple unfold technique is used to propagate the laboratory measurement to the parton level simultaneously in the top quark rapidity and top-antitop invariant mass. The result is interprted as an integral asymmetry above a sliding invariant mass threshold. We analyze 1.9/fb of data in the lepton+jet+btag channel, and present measurements for eight different invariant mass thresholds covering the 400 to 800 GeV/cˆ2 mass region.

Author: Dr TECCHIO, Monica (University of Michigan)

Presenter: Dr TECCHIO, Monica (University of Michigan)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **301** Type: **not specified**

FCNC, LFV, and other rare decays at CDF.

The CDFII detector at the Fermilab Tevatron has now collected more than 5 fb-1 of data, and is the ideal place to search for rare and forbidden heavy flavor decays. Here we report recent results for rare decays of B and D hadrons with a lepton pair in the final state.

Author: CDF COLLABORATION, The (Various)

Presenter: CDF COLLABORATION, The (Various)

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **302** Type: **not specified**

Top quark mass: latest CDF results, Tevatron combinations, and electroweak implications

Tuesday 28 July 2009 18:05 (25 minutes)

We report the results of the measurements of the top quark mass in the lepton+jet, dilepton, and all-jets channels using top pair events corresponding to an integrated luminosity of more than 4 fb-1 from proton- antiproton collisions at the Tevatron recorded by the CDF II detector. We present different results using different techniques in the lepton + jets, dilepton, all-jets channels and describe the current status of the systematic uncertainties. We present results on the precision measurement of the top quark mass and a combination of the best CDF top mass measurements. We present also a combination by the TevEWWG (Tevatron electroweak working group) of the best top mass results from CDF and D0 in Run 1 and Run 2 of the Tevatron. This result is the current world average, and offers an uncertainty almost reaching 1 GeV. The new mass value has been included in traditional LEP EWWG fits to precision electroweak data, and implications for the Standard Model Higgs have been derived.

Author: Prof. CANELLI, Florencia (FNAL)

Presenter: VELLIDIS, Costas

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **303** Type: **not specified**

Analysis of Bs->phiphi decay mode.

Tuesday 28 July 2009 14:48 (24 minutes)

An interesting decay mode of the Bs meson is into a phi pair: this is a vector-vector decay dominated by b->sss penguin transition which is a sensitive probe for possible new physics effects. The only existing sample of this mode was reconstructed by the CDF experiment from 0.2 fb-1 of data, and consisted of only 8 signal events. Here we present new results based on a clean sample of about 300 Bs->phiphi decays reconstructed by the CDFII detector in a dataset with an integrated luminosity of about 3 fb-1.

Authors: DI RUZZA, Benedetto (CDF Collaboration); CDF COLLABORATION, The (Various)

Presenter: DI RUZZA, Benedetto (CDF Collaboration)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **304** Type: **not specified**

Properties of the top quark

Monday 27 July 2009 17:50 (20 minutes)

More than a decade after its discovery we are still trying to find out more about the nature of the top quark. The current statistics of the Tevatron allow us to make stringent tests. In this talk we will present state of the art measurements of top quark properties. By studying rates and distributions sensitive to the production and decay mechanisms of top quarks, we can search for contamination from non-standard model particles, or subtle differences in the electroweak or strong interactions that govern top quark interactions. We will present the most recent and precise measurements of the properties of the top quark such charge, lifetime, width, and more done by the CDF experiment at Fermilab.

Author: Dr CANELLI, Florencia (FNAL)

Presenter: LEE, Hyunsu (University of Chicago)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **305** Type: **not specified**

B hadron lifetimes at CDF

At first order all b-hadrons have equal lifetimes given by the lifetime of b-quark. The effects of spectator quark in the hadron then introduces corrections which yields to differences in the b-hadron lifetimes. The corrections can be predicted rather precisely and therefore precise measurements can test our understanding of spectator effects. We report measurements of lifetimes of B+, B0,Bs and Lambda_b performed at CDF using significantly larger data samples than previously available. Samples include both final states with J/psi in the final state as well as semileptonic and fully hadronic final states collected by impact-parameter based triggers.

Author: CDF COLLABORATION, The (Various)

Presenter: CDF COLLABORATION, The (Various)

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **308** Type: **not specified**

Lifetime difference in B(s) mixing: Standard model and beyond.

Tuesday 28 July 2009 14:00 (24 minutes)

We present a calculation of 1/m2b corrections to the lifetime differences of Bs mesons in the heavy-quark expansion. We find that they are small to significantly affect \Delta\GammaB_s and present the result for lifetime difference including non-perturbative 1/mb and 1/m2b corrections. We also analyze the generic B = 1 New Physics contributions to the lifetime difference of Bs mesons and provide several examples.

Author: BADIN, Andriy (Wayne State University)

Co-authors: Prof. PETROV, Alexey (Wayne State University); Dr GABBIANI, Fabrizio (Wayne State University)

Presenter: BADIN, Andriy (Wayne State University)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **309** Type: **not specified**

Light Dark Matter annihilation in model independent approach.

Tuesday 28 July 2009 15:40 (20 minutes)

We examine annihilation of light bosonic Dark Matter into pair of photons in model-independent way. We consider the simplest generic Lagrangian describing such process and then compare results to the available experimental data. We match effective generic lagrangian to results obtained within
particular Dark matter models and determine possible constrains onto
parameter space of those models.

Author: BADIN, Andriy (Wayne State University)

Co-authors: Prof. PETROV, Alexey (Wayne State University); YEGHIYAN, Gagik (Wayne State University)

Presenter: BADIN, Andriy (Wayne State University)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **310** Type: **not specified**

Search for diboson production in final states with one lepton, missing transverse energy, and jets at CDF

Thursday 30 July 2009 14:40 (20 minutes)

We present a search for WW plus WZ production in the lepton plus missing transverse energy plus two jets channel at CDF. A matrix element technique is employed to separate the signal from the large W plus jets background. The WW plus WZ production cross section is measured and compared against the standard model NLO prediction.

Author: HURWITZ, Martina (University of Chicago)

Presenter: HURWITZ, Martina (University of Chicago)

Session Classification: Electroweak Physics II

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **311** Type: **not specified**

The Higgs boson as a portal to dark matter

Thursday 30 July 2009 14:00 (30 minutes)

The Higgs boson is the missing piece of the SM. While the Tevatron and LHC search for the nature of the Higgs, dark matter detection experiments aim to uncover the dark sector. I will review various models that connect these two exciting sectors and discuss their associated signatures.

Author: Dr SHAUGHNESSY, Gabe (Northwestern University / Argonne National Laboratory)

Presenter: Dr SHAUGHNESSY, Gabe (Northwestern University / Argonne National Laboratory)

Session Classification: Higgs Physics III

Track Classification: Higgs Physics

Contribution ID: **312** Type: **not specified**

Search for Supersymmetry in ppbar Collisions at root(s)=1.96 TeV Using the Trilepton Signature of Chargino-Neutralino Production

Monday 27 July 2009 14:40 (20 minutes)

The production of chargino-neutralino pairs and their subsequent leptonic decays is one of the most promising supersymmetry (SUSY) signatures at the Tevatron proton-antiproton collider. We present here the most recent results on the search for the three-lepton and missing-transverse-energy SUSY signature using data collected with the CDF II detector. The results are interpreted within the minimal supergravity (mSUGRA) scenario.

Author: Mr FORREST, Rob (UC Davis)

Presenter: Mr FORREST, Rob (UC Davis)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **313** Type: **not specified**

An imaging time-of-propagation system for charged particle identification at a Super B factory

Friday 31 July 2009 14:50 (25 minutes)

Super B factories that will perform precision tests of the flavor sector of the Standard Model and searches for new physics will demand excellent charged particle identification (PID), particularly K/π separation, for momenta up to 4 GeV/c, as well as the ability to operate under beam backgrounds significantly higher than current B factory experiments. We describe an Imaging Time-of-Propagation (iTOP) detector which shows significant potential to meet these requirements. This detector utilizes the concept of detection of internally reflected Cerenkov light (DIRC), but with an imaging plane of significantly reduced size relative to previous DIRC implementations. This imaging plane is instrumented with finely pixelated photodetectors with timing resolution of ˜50 ps. Precision measurements of photon arrival times are supplemented with the two dimensional imaging information to provide excellent PID capability in a compact detector envelope. Results of ongoing optimization of the configuration of such a detector are presented, as well as simulated PID performance.

Author: NISHIMURA, Kurtis (University of Hawaii)

Co-authors: JACOBSON, Bryce (University of Hawaii); VARNER, Gary (University of Hawaii); HOEDL-MOSER, Herbert (University of Hawaii); KENNEDY, James (University of Hawaii); RUCKMAN, Larry (University of Hawaii); ROSEN, Marc (University of Hawaii); BROWDER, Thomas (University of Hawaii)

Presenter: NISHIMURA, Kurtis (University of Hawaii)

Session Classification: Detectors II

Track Classification: Detector Technology and R&D

Contribution ID: **314** Type: **not specified**

Photon Searches at CDF

Tuesday 28 July 2009 15:40 (20 minutes)

Many new physics models predict mechanisms that could produce a γ and jets signature. We search in the γ + jets and γ + jets +
met channels, independent of any model, for new physics using 2˜fb^{-1} of CDF Run II data collected at the Fermilab Tevatron from $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV. A variety of techniques are applied to estimate the standard model expectation and non-collision backgrounds. We examine several kinematic distributions including
met, ΣE_T, and masses for discrepancies with the standard model.

Author: Dr CULBERTSON, Raymond (Fermilab)

Presenter: LEE, Eunsin (Texas A&M University)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **320** Type: **not specified**

Quantum Correlated Neutral D Meson Decays

Tuesday 28 July 2009 18:06 (24 minutes)

The decays of D0 and D0bar mesons produced from e+ e- annihilation at the psi(3770) resonance reflect quantum correlations, so that decay rates are sensitive to interference between indistinguishable final states. Using the CLEO-c detector at the Cornell Electron Storage Ring, we measure the time-independent decay rates of D0 decays to K- pi+, K+ pi-, several CP eigenstates, and semi-electronic states. We make use of both partially- and fully-reconstructed D0 D0bar pairs. A chiˆ2 minimization fitter extracts from these decay rates mixing and doubly Cabibbo suppressed decay parameters xˆ2, y, rˆ2, and cos(delta), along with isolated D0 branching fractions for all input final states. By constraining the branching fractions and rˆ2 with independent measurements, a first measurement of cos delta can be made. This result will be presented, and plans for improving this result will be outlined, including additional CP eigenstates, semi-muonic states, and wrong-sign semileptonic events such as K- pi+ vs. X e+ nu.

Authors: Dr LINCOLN, Adam (Wayne State University); Prof. CASSEL, David (Cornell University)

Presenter: Dr LINCOLN, Adam (Wayne State University)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **321** Type: **not specified**

Semileptonic Charm Meson Decays

Thursday 30 July 2009 14:24 (20 minutes)

Using the entire CLEO-c psi(3770) −> DDbar event sample, corresponding to an integrated luminosity of 818 pb-1 and approximately 5.2 million DDbar events, we present a study of the decays D0 −> pi- e+ nu, D0 −>
K- e+ nu, D+ −> pi0 e+ nu, and D+ −> K0bar e+ nu. Using a tagged analysis technique, in which one D is fully reconstructed in a hadronic mode, absolute partial rates for semileptonic decays by the other D are measured in several qˆ2 bins. We fit these rates using several form factor parameterizations and report the results, including form factor shape parameters and branching fractions. We compare the form factor results to recent Lattice Quantum Chromodynamics (LQCD) calculations. Taking input from LQCD, we make the most precise measurement of |Vcs| and a precision measurement of |Vcd|. We also present studies of other D+ and D0 semileptonic decays and semileptonic decays of Ds mesons obtained from a run above the Ds meson pair production threshold.

Authors: Prof. CASSEL, David (Cornell University); SHIPSEY, Ian (Purdue University)

Presenter: SHIPSEY, Ian (Purdue University)

Session Classification: Heavy Flavor Physics III

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **322** Type: **not specified**

Measurements of Hadronic Decays of D0, D+, and Ds Mesons

Thursday 30 July 2009 15:12 (20 minutes)

We report recent results on hadronic decays of D0, D+, and Ds mesons. Results include branching fractions for D0, D+, and Ds decays to two pseudoscalars; the first measurements of absolute branching fractions for Ds decay; exclusive Ds −> omega X decays; inclusive hadronic Ds decays; and Dalitz analyses of Ds −> K+ K- pi+ and D+ −> K+ K- pi+ decays.

Authors: Prof. CASSEL, David (Cornell University); CINABRO, David (Wayne State University)

Presenter: CINABRO, David (Wayne State University)

Session Classification: Heavy Flavor Physics III

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **323** Type: **not specified**

Recent atmospheric neutrino results using the SK-I, SK-II, SK-III datasets

Monday 27 July 2009 15:20 (15 minutes)

We present recent results from analyses of atmospheric neutrino data using the Super-Kamiokande water Cherenkov detector, which has a fiducial volume of 22,500 tons of ultra-pure water. Data from three major running periods of SK are used in the analyses.

Author: RAAF, Jennifer (Boston University)

Presenter: RAAF, Jennifer (Boston University)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **324** Type: **not specified**

The Hamiltonian Approach to Yang-Mills (2+1): An Expansion Scheme and Corrections to String Tension

Friday 31 July 2009 14:00 (20 minutes)

We carry out further analysis of the Hamiltonian approach to Yang-Mills theory in 2+1 dimensions which helps to place the calculation of the vacuum wave function and the string tension in the context of a systematic expansion scheme. The solution of the Schrodinger equation is carried out recursively. The computation of correlators is re-expressed in terms of a two-dimensional chiral boson theory. The effective action for this theory is calculated to first order in our expansion scheme and to the fourth order in a kinematic expansion parameter. The resulting corrections to the string tension are shown to be very small, in the range -0.3% to -2.8%, moving our prediction closer to the recent lattice estimates.

Author: Dr YELNIKOV, Alexandr (City College of New York)

Co-authors: Dr KARABALI, Dimitra (Lehman College of the CUNY); Dr NAIR, V. P. (City College of New York)

Presenter: Dr YELNIKOV, Alexandr (City College of New York)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **325** Type: **not specified**

A critical look at hadronic b \to s penguin modes

Monday 27 July 2009 14:50 (20 minutes)

CKM mechanism of a single CP-violating phase has been confirmed by various B decay data over the decade. Yet, the existence of new physics effects can not be ruled out.
In this context,
we consider the branching ratios and CP asymmetries in two theoretically clean modes, namely in $B \to f_0(980) K_S$ and $B \to \phi K_S$ decays, to the end of determining the deviation of time dependent CP asymmetry from $\sin(2\beta)$ arising from Standard
Model physics. We use the QCD factorization framework for the decay amplitudes and employ a parameter scan to probe a broad range of theoretical models, exploring variations in the inputs at the 3σ level and the ill-known $calO(1/M_B)$ corrections with 100% uncertainty. The excursions in time dependent CP asymmetry from
$\sin(2\beta)$ are under sufficient theoretical control to enable the interpretation
of experimental results of much higher precision.

Authors: DUTTA, Rupak (University of Kentucky); Prof. GARDNER, Susan (University of Kentucky)

Presenter: DUTTA, Rupak (University of Kentucky)

Session Classification: CP-violation I

Track Classification: CP-violation

Contribution ID: **326** Type: **not specified**

Direct jet reconstruction in p + p and Cu + Cu at PHENIX

Friday 31 July 2009 17:00 (30 minutes)

The Relativistic Heavy Ion Collider uses the collision of heavy nuclei to create a strongly interacting, partonic medium, while the collision of $p + p$ provides a baseline measurement to determine the medium modification effect. Direct jet reconstruction applied to these collision systems offers a crucial constraint on the mechanism for in-medium parton energy loss and jet-medium interactions. However, traditional jet reconstruction algorithms operating in the large soft background at RHIC give rise to fake jets well above the intrinsic production rate of high-p_T partons, impeding the detection of the low cross section jet signal at RHIC energies. We developed a new jet reconstruction algorithm that uses a Gaussian filter to locate and reconstruct the jet energy. This algorithm is combined with a fake jet rejection scheme that provides efficient jet reconstruction with acceptable fake rate in a background environment up to the central $\mathrm{Au} + \mathrm{Au}$ collision at $\sqrt{s_{NN}} = 200\,\mathrm{GeV}$˜[1]. We present results of its application in $p+p$ and $\mathrm{Cu}+\mathrm{Cu}$ collisions using data from the PHENIX detector, including jet spectra, jet–jet angular correlation, and the nuclear modification factor. We discuss the comparison and implication for models, and further outline our future program for jet physics using the PHENIX detector.

[1] Y.-S.˜Lai and B.A.˜Cole, arXiv:0806.1499 (2008).

Author: LAI, Yue Shi (Columbia University-Unknown-Unknown)

Presenter: LAI, Yue Shi (Columbia University-Unknown-Unknown)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **327** Type: **not specified**

Solitons in AdS1+1

Friday 31 July 2009 16:30 (20 minutes)

Soliton solutions in scalar field theory in an AdS1+1 background are investigated. Analytic soliton solutions are obtained in specific models, and their mass is calculated. The fluctuation spectrum is determined, and the quantum correction to the soliton mass is computed.

Author: Prof. TER VELDHUIS, Tonnis (Macalester College)

Presenter: Prof. TER VELDHUIS, Tonnis (Macalester College)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **328** Type: **not specified**

Production measurements at LHCb with the first data

Monday 27 July 2009 14:48 (20 minutes)

We report on the perspective measurements of inclusive particle production in high-energy pp collisions with data to be collected by the LHCb experiment at CERN's LHC. These include V0 and D meson production studies, which can be based on a minimum bias sample, as well as charmonia production studies, which need a muon-triggered samples. Using reconstructed J/psi -> mu+mu- decays, both the prompt J/psi and b -> J/psi production cross-sections will be determined, in the forward pseudo-rapidity range of 2-5 covered by LHCb. Due to the large production rate, such analyses will be possible with very small integrated luminosities of the order of a few pb-1. Other charmonia related measurements will also be discussed, such as that of the J/psi polarization at production or of the production of some of the new X, Y and Z states.

Authors: Dr DETTORI, Francesco (Università degli Studi di Cagliari / INFN); PEPE-ALTARELLI, Monica (CERN)

Presenter: Dr DETTORI, Francesco (Università degli Studi di Cagliari / INFN)

Session Classification: Heavy Flavor Physics I

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **329** Type: **not specified**

The CLEAR Experiment

Friday 31 July 2009 15:15 (25 minutes)

The Spallation Neutron Source in Oak Ridge, Tennessee, is designed to produce intense pulsed neutrons for various science and engineering applications. Copious neutrinos are a free by-product. When it reaches full power in 2009, the SNS will be the world's brightest source of neutrinos in the few tens of MeV range. The proposed CLEAR (Coherent Low Energy A (Nuclear) Recoils) experiment will measure coherent elastic neutral current neutrino-nucleus scattering at the SNS. The physics reach includes tests of the Standard Model.

Author: SCHOLBERG, Kate (Duke University)

Presenter: SCHOLBERG, Kate (Duke University)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **330** Type: **not specified**

Muon Ionization Cooling R and D in the MuCool program

Tuesday 28 July 2009 14:00 (30 minutes)

The MuCool program focuses on studying the components needed for a muon ionization cooling channel. These include normal-conducting RF cavities, liquid hydrogen and lithium hydride absorbers and superconducting solenoids. This talk will describe the facility that has been built at Fermilab to carry out this R and D, will outline the various aspects of the program and will give the latest results concerning high-gradient RF cavity operation and absorber R&D. Finally, the program goals for the next 2-3 years will be described.

Author: Prof. BROSS, Alan (Fermilab)

Presenter: TORUN, Yagmur (Illinois Institute of Technology)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **331** Type: **not specified**

Computation of the string tension in Yang-Mills theory using large N reduction

Friday 31 July 2009 16:30 (25 minutes)

Continuum reduction and Monte Carlo simulation are used to calculate the heavy quark potential and the string tension in large N Yang-Mills theory in three and four dimensions in the confined phase. In addition, the spatial string tension in the 2+1 high T phase is also measured. With reduction, the potential can be calculated out to separations larger than the lattice extent.

Authors: Prof. KISKIS, Joe (UC Davis); Prof. NARAYANAN, Rajamani (Flordia International University)

Presenter: Prof. KISKIS, Joe (UC Davis)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **332** Type: **not specified**

The Majorana Neutrinoless Double-Beta Decay Experiment

Friday 31 July 2009 15:10 (15 minutes)

The observation of neutrinoless double-beta decay would establish that the neutrino is a Majorana particle, would help determine the absolute mass scale of the neutrino, and could provide insight into understanding lepton-number-violating processes. The Majorana Collaboration plans to search for this process in 76Ge using high-purity germanium detectors in an ultra-low-background environment. The experiment will proceed in a phased approach with the eventual goal to scale to a 1-tonne experiment. The first phase, the Majorana Demonstrator, will deploy 60 kg of detectors to test the Klapdor-Kleingrothaus result (Modern Physics Letters A, Vol. 21, No. 20 (2006)1547-1566) and to establish backgrounds low enough to enable scaling to 1 tonne (1 count/tonne-year in the double-beta decay region of interest). Achieving this background goal is being addressed with efforts including low-mass front-end electronics development, copper electroforming, and low-capacitance, low-noise detector development. This presentation will provide an outline of the experiment and an update on current status.

Author: MARINO, Michael (University of Washington)

Presenter: MARINO, Michael (University of Washington)

Session Classification: Neutrino Physics IV

Track Classification: Neutrino Physics

Contribution ID: **333** Type: **not specified**

Could leptons, quarks or both be highly relativistic, bound states of a minimally interacting fermion and scalar?

Friday 31 July 2009 17:10 (20 minutes)

To begin exploring the possibility that leptons, quarks, or both, might be highly relativistic bound states, a numerical method for solving two-body, bound-state Bethe-Salpeter equations is discussed. This class of integral equations is difficult to solve, not because the equations are usually non-separable, but rather because it is typically impossible to discretize the equations in such a way that the coupling constant, which is real in the Lagrangian, is also always real when calculated as an eigenvalue of the discretized equation. Using the systematic method discussed here, complete sets of solutions with real coupling constants
can be calculated for many, if not all, two-body, bound-state Bethe-Salpeter equations.

Author: Prof. MAINLAND, G. Bruce (The Ohio State University at Newark)

Presenter: Prof. MAINLAND, G. Bruce (The Ohio State University at Newark)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **334** Type: **not specified**

Heavy quarkonia measurements at STAR

Tuesday 28 July 2009 14:25 (25 minutes)

The measurements of charmonium and bottomonium resonances in ultra-relativistic heavy-ion collisions provide crucial information on the dynamics of the created high-density QCD matter. The suppression of heavy quark-antiquark bound states is generally agreed to be one of the most direct probes of QGP formation due to screening of the color potential in the plasma. In addition, the production of heavy-quarks proceeds mainly via initial parton-parton processes and, as such, the production of heavy quarkonia in p+p and d+Au collisions will provide valuable information on the baseline and the initial-state modifications. In this presentation, we will review the measurements of heavy quarkonia at STAR experiment.

Author: Dr LIU, Haidong (University of California (UCD)-Unknown-Unknown)

Presenter: Dr LIU, Haidong (University of California (UCD)-Unknown-Unknown)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **335** Type: **not specified**

MANX, A 6-D Muon Beam Cooling Experiment

Monday 27 July 2009 18:00 (30 minutes)

MANX is a six-dimensional muon ionization cooling demonstration experiment based on the concept of a helical cooling channel in which a beam of muons loses energy in a continuous helium or hydrogen absorber while passing through a special superconducting magnet called a helical solenoid. The goals of the experiment include tests of the theory of the helical cooling channel and the helical solenoid implementation of it, verification of the simulation programs, and a demonstration of effective six-dimensional cooling of a muon beam. We report the status of the experiment and in particular, the proposal to have MANX follow MICE at the Rutherford-Appleton Laboratory (RAL) as an extension of the MICE experimental program. We describe the economies of such an approach which allow the MICE beam line and much of the MICE apparatus and expertise to be reused.

Summary

The MANX experiment is proposed to demonstrate 6-D muon ionization cooling in a helical cooling channel. The concept of the MANX experiment is discussed. Two measurement modes are shown. By observing the momentum dependent time of flight without absorber in the HCC, the essential features of the HCC will be determined. In addition, the required resolution for the 6-D parameters is discussed. The most challenging measurement is the total momentum. This resolution will be determined by reconstruction in the particle tracking system.

Author: Dr CUMMINGS, Mary Anne (Muons, Inc.)

Co-authors: Dr YONEHARA, Katsuya (Fermilab); Dr ABRAMS, Robert (Muons, Inc.); Dr KAHN, Stephen (Muons, Inc.)

Presenter: Dr CUMMINGS, Mary Anne (Muons, Inc.)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **336** Type: **not specified**

Results from the Cryogenic Dark Matter Search experiment

Tuesday 28 July 2009 14:00 (20 minutes)

The Cryogenic Dark Matter Search (CDMS) experiment uses low-temperature solid-state detectors to seek Weakly Interacting Massive Particle (WIMP) and has the world's best exclusion limit on the WIMP-nucleon spin-independent cross section. The experiment uses the ionization and athermal phonons from particle interactions to discriminate between candidate (nuclear recoil) and background (electron recoil) events with extremely high efficiency. In this talk I will describe the experiment and present our most recent results from the 5-tower data run.

Author: Dr KAMAEV, Oleg (University of Minnesota)

Presenter: Dr KAMAEV, Oleg (University of Minnesota)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **337** Type: **not specified**

Prospects for measuring Top Pair Production using a likelihood method at ATLAS in 10 TeV p-p Collisions

Tuesday 28 July 2009 14:55 (15 minutes)

Due to the large top quark production cross section at the LHC energies, the ATLAS experiment is expected to have enough statistics to measure the top quark cross section even at initial luminosities. Recent studies performed in ATLAS on the development of top quark pair cross section measurements using the likelihood method will be discussed. An emphasis will be on measurements with data that will be collected in the first year of the LHC run. The potential of using the top quark events for b-tagging calibration will also be briefly discussed.

Authors: JANA, Dilip (University of Oklahoma); COCHRAN JR, James Herbert (Iowa State University-Unknown-Unknown)

Co-authors: RIZATDINOVA, Flera (Oklahoma State University); Prof. SKUBIC, Patrick (University of Oklahoma)

Presenter: JANA, Dilip (University of Oklahoma)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **338** Type: **not specified**

Heavy Ion Physics After Nine Years of RHIC Operation

Thursday 30 July 2009 14:00 (45 minutes)

The Relativistic Heavy Ion Collider at Brookhaven National Laboratory was designed to explore the confinement to de-confinement transition in QCD at high temperatures and low baryon densities. Results from the RHIC program have provided overwhelming circumstantial evidence for the formation of quark gluon plasma in nuclear collisions at RHIC. Estimates obtained from several different RHIC measurements indicate that collisions between gold nuclei at the top RHIC energy of 200 GeV per colliding nucleon pair produce matter at an energy density in excess of 10 GeV/fmˆ3 or at temperatures in excess of 300 MeV. Those same results indicate that the quark gluon plasma produced at RHIC is strongly coupled with a viscosity to entropy ratio of the same order as a (AdS/CFT) conjectured lower bound. Measurements of high transverse particle production indicates strong "quenching" of jets in the quark gluon plasma and a strong medium response to the passage of those jets. Measurements of meson and baryon transverse momentum spectra suggest a surprisingly simple picture in which hadrons are produced via the statistical recombination of quarks from the quark gluon plasma. The results that form the basis for these interpretations and the the interpretations themselves will be critically reviewed. Possible tests of current interpretations of RHIC data using future RHIC measurements and measurements at the LHC will be discussed.

Author: COLE, Brian (Physics Dept., Pupin Physics Lab.-Columbia University-Unknown)

Presenter: COLE, Brian (Physics Dept., Pupin Physics Lab.-Columbia University-Unknown)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **339** Type: **not specified**

Instabilities and Interactions in Cosmology's Dark Sector

Monday 27 July 2009 17:20 (20 minutes)

I consider couplings between the dark energy and dark matter sectors, and describe constraints arising from a combination of new instabilities, cosmological observations and the requirement of a weak coupling regime.

Author: Prof. TRODDEN, Mark (University of Pennsylvania)

Presenter: Prof. TRODDEN, Mark (University of Pennsylvania)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **340** Type: **not specified**

The Open Science Grid and High Energy Physics

Monday 27 July 2009 15:00 (30 minutes)

The Open Science Grid (OSG) enables collaborative science by providing a national cyber-infrastructure of distributed computing and storage resources. The goal of the OSG is to transform processing and data intensive science through a cross-domain, self-managed, nationally distributed cyber-infrastructure that brings together campus and community resources. The High Energy Physics community has had a leadership role in the development, integration, adoption, deployment, and use of the OSG. Many other scientific communities actively use the infrastructure and share the accessible resources through their membership in the OSG without the need for prior allocation. Perspectives from the Tevatron, LHC experiments, neutrino experiments and more will be discussed. We will cover how OSG's collaborative approach to the engagement of new science applications and campus-wide cyberinfrastructures - to support an expanding mix of physics and non-physics applications and resources - provides mutual benefit to all.

Author: Dr HOLZMAN, Burt (CMS)

Presenter: Dr HOLZMAN, Burt (CMS)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **341** Type: **not specified**

New Experiments with Antiprotons

Tuesday 28 July 2009 15:25 (25 minutes)

Fermilab operates the world's most intense antiproton source. Newly proposed experiments can use those antiprotons either parasitically during Tevatron Collider running or after the Tevatron Collider finishes in about 2011. For example, the annihilation of 8 GeV antiprotons might make the world's most intense source of tagged Dˆ0 mesons, and thus the best near-term opportunity to study charm mixing and, via CP violation, to search for new physics. Other precision measurements that could be made include properties of the X(3872) and the charmonium system.

Author: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

Presenter: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

Session Classification: Hadron Spectroscopy I

Track Classification: Hadron Spectroscopy

Contribution ID: **342** Type: **not specified**

Scalable Database Access Technologies for ATLAS Distributed Computing

Monday 27 July 2009 16:30 (20 minutes)

ATLAS event data processing requires access to non-event data (detector conditions, calibrations, etc.) stored in relational databases. The database-resident data are critical for the event data reconstruction processing steps and are often required for user analysis. A main focus of ATLAS database operations is on the worldwide distribution of the Conditions DB data, which are necessary for every data processing job. Since the Conditions DB is critical for operations with real data, we have developed a system where a different technology can be used as a redundant backup. Redundant database operations infrastructure fully satisfies the requirements of ATLAS reprocessing, which has been demonstrated on a scale of 1B database queries during the reprocessing campaign of 0.5 PB of single-beam and cosmics data on the Grid. To collect experience and provide input for a best choice of technologies, several promising options for efficient database access in user analysis are undergoing evaluation and testing. We present the ATLAS experience with scalable database access technologies and describe our approach for prevention of database access bottlenecks in a Grid computing environment.

Authors: COCHRAN JR, James Herbert (Iowa State University); VANYASHIN, Sasha (Argonne National Laboratory)

Presenter: VANYASHIN, Sasha (Argonne National Laboratory)

Session Classification: Computing

Track Classification: Computing in HEP

Contribution ID: **343** Type: **not specified**

Fermilab Main Injector

Thursday 30 July 2009 14:30 (30 minutes)

We report on the current status and future plans of Fermilab's Main Injector.

Author: ADAMSON, Philip (Fermilab)

Presenter: ADAMSON, Philip (Fermilab)

Session Classification: Accelerators III

Track Classification: Accelerator Physics

Contribution ID: **344** Type: **not specified**

Improving the precision of light quark mass determinations

Friday 31 July 2009 16:55 (25 minutes)

Quark masses are fundamental parameters of QCD. Their accurate determination is thus a mandatory task. Light quark masses can be determined non-perturbatively through lattice simulations in a given renormalization scheme, e.g. a momentum subtraction scheme. The MSbar scheme is not directly amenable in lattice simulations since it is closely related to dimensional regularization. To obtain results for the light quark masses in MSbar scheme conversion factors are needed, which transform the quark mass from a momentum subtraction scheme to MSbar scheme. Such conversion factors can be computed in continuum perturbation theory. The concepts and framework of a new improved scheme as well as the perturbative computation of the conversion is discussed in the talk. The work is based on the results of 0901.2599 [hep-ph].

Author: STURM, Christian (Brookhaven National Laboratory)

Co-authors: SONI, A. (Brookhaven National Laboratory); SACHRAJDA, C.T.C. (University of Southampton); CHRIST, N.H. (Columbia University); IZUBUCHI, T. (Brookhaven National Laboratory); AOKI, Y. (RIKEN-BNL Research Center, BNL)

Presenter: STURM, Christian (Brookhaven National Laboratory)

Session Classification: QCD II

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **345** Type: **not specified**

Top Polarization And New Physics

Monday 27 July 2009 16:30 (15 minutes)

The top quark's uniquely large Yukawa coupling hints at a special connection between the top quark and the physics responsible for electroweak symmetry breaking. If new physics at the LHC is related to the electroweak hierarchy, it will typically lead to observable polarization signals for top quarks produced in association with new physics. Signals are observable for both events with and without missing energy and for hadronic as well as leptonic top quarks.

Author: Dr SHELTON, Julia (Jessie) (Rutgers University)

Presenter: Dr SHELTON, Julia (Jessie) (Rutgers University)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **349** Type: **not specified**

Pulsars and Indirect Signals for Dark Matter

Tuesday 28 July 2009 15:00 (20 minutes)

Recently there have been many anomalies in the cosmic ray data in the energy range 10 GeV to 1 TeV. In addition, there is the WMAP "Haze" excess in the 22 GHz to 93 GHz frequency range. We propose that pulsars could describe all of these excesses and discuss the relevant astrophysics.

Author: PHALEN, Daniel (University of Michigan - Ann Arbor)

Presenter: PHALEN, Daniel (University of Michigan - Ann Arbor)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **350** Type: **not specified**

First Observation of Diboson Production in Hadronic Final State at Tevatron

Thursday 30 July 2009 15:00 (20 minutes)

We present the first observation in hadronic collisions of the electroweak production of vector boson pairs (VV, V=W,Z) where one boson decays to a dijet final state. The data correspond to 3.5 fbˆ-1 of integrated luminosity of p-pbar collisions at sqrt(s)=1.96 TeV collected by the CDF II detector at the Fermilab Tevatron. Event selection requires two jets and large transverse momentum imbalance. The analysis employs several novel techniques to suppress multijet background and reduce systematic uncertainties. We observe 1516±239(stat)±144(syst) diboson
candidate events and measure a cross section σ(ppbar⟶VV+X) of 18±2.8(stat)±2.4(syst)±1.1(lumi) pb, in agreement with standard model expectations.

Author: PURSLEY, Jennifer (Wisconsin)

Presenter: PURSLEY, Jennifer (Wisconsin)

Session Classification: Electroweak Physics II

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **351** Type: **not specified**

Muon Cooling and Future Muon Facilities

Monday 27 July 2009 17:30 (30 minutes)

Muon colliders and neutrino factories are attractive options for future facilities aimed at achieving the highest lepton-antilepton collision energies and precision measurements of parameters of the neutrino mixing matrix. The performance and cost of these depend sensitively on how well a beam of muons can be cooled. Recent progress in muon cooling design studies and prototype tests nourishes the hope that such facilities can be built in the decade to come.

Author: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

Presenter: Prof. KAPLAN, Daniel (Illinois Institute of Technology)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **352** Type: **not specified**

Motivations for a New Force in the Dark Sector

Tuesday 28 July 2009 15:20 (20 minutes)

A new force in the dark sector, with GeV-scale force carriers, can change the expected properties of SUSY WIMP dark matter in significant ways. The annihilation cross section at low velocities is boosted by a Sommerfeld enhancement, perhaps by 2 or 3 orders of magnitude; the WIMP annihilates to the new force carrier, which immediately
decays to light particles, bypassing constraints from antiprotons and pi-0 gammas;
and excited states for the WIMP are naturally generated, making inelastic scattering
possible. These are exactly the properties needed to explain recent results
from cosmic ray measurements and the DAMA direct detection experiment,
without violating the many tight constraints from other experiments.
I will review the current status of the data, show how it can be explained with
such a WIMP, and discuss the "smoking gun" signals expected in future
data sets (Fermi LAT, CDMS, CRESST, LUX, etc.).
Recently measured anomalous excesses of 10-1000 GeV electron and positron cosmic rays have motivated WIMP models with large annihilation cross sections, especially when the relative velocity of the annihilating particles is low. I will show that these models are already uniformly close to the 95% confidence limits from WMAP, and the recently launched Planck satellite will be capable of ruling out a wide range of DM explanations for the cosmic ray excesses. In models of dark matter with Sommerfeld-enhanced annihilation, where sigma v rises with decreasing WIMP velocity until some saturation point, WMAP places strong constraints on the allowed parameter space, with implications for collider searches and annihilation signatures from substructure.

Summary

A new force in the dark sector, with GeV-scale force carriers, can change the expected properties of SUSY WIMP dark matter in significant ways. The annihilation cross section at low velocities is boosted by a Sommerfeld enhancement, perhaps by 2 or 3 orders of magnitude; the WIMP annihilates to the new force carrier, which immediately
decays to light particles, bypassing constraints from antiprotons and pi-0 gammas;
and excited states for the WIMP are naturally generated, making inelastic scattering
possible. These are exactly the properties needed to explain recent results
from cosmic ray measurements and the DAMA direct detection experiment,
without violating the many tight constraints from other experiments.
I will review the current status of the data, show how it can be explained with
such a WIMP, and discuss the "smoking gun" signals expected in future
data sets (Fermi LAT, CDMS, CRESST, LUX, etc.).

Author: Ms SLATYER, Tracy (Harvard University)

Co-authors: Prof. FINKBEINER, Douglas (Harvard-Smithsonian Center for Astrophysics); Dr PADMANABHAN, Nikhil (Lawrence Berkeley National Laboratory)

Presenter: Ms SLATYER, Tracy (Harvard University)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **353** Type: **not specified**

The Daya Bay Reactor Antineutrino Experiment

Tuesday 28 July 2009 17:50 (15 minutes)

The Daya Bay Reactor Anti-Neutrino Experiment is a neutrino oscillation experiment designed to observe and measure the neutrino mixing angle θ13. The sensitivity goal is 0.01 in sinˆ2(2θ13) at the 90% confidence level, a significant improvement over the current limit. This will be accomplished by measuring the relative rates and energy spectra of reactor electron antineutrinos with multiple detectors positioned at different baselines. Installation and commissioning activities are scheduled to begin with a year and be complete in 2011, followed by a three-year run. This presentation will discuss the detector design, construction, and installation plans.

Summary

This is one of two Daya Bay Reactor Experiment talks submitted to DPF2009. This talk will focus on the detector design and construction while the other talk will discuss the physics potential and sensitivity.

Author: Prof. WHITE, Christopher (Illinois Institite of Technology)

Presenter: Prof. WHITE, Christopher (Illinois Institite of Technology)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **354** Type: **not specified**

Entangled Bs-Bs States at The Upsilon 5s

Tuesday 28 July 2009 16:30 (24 minutes)

B factories which are run at the Upsilon 5s peak can produce Bs pairs in an entangled state. This system therefore provides methods to measure CP violation and mixing in the Bs meson that are not available if Bs mesons are produced in hadronic collisions. I will discuss efficient strategies for using entangled Bs pairs to learn about the mixing of the Bs meson.

Author: ATWOOD, David (Iowa State University)

Presenter: ATWOOD, David (Iowa State University)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **356** Type: **not specified**

Compact, Achromatic Non-scaling FFAG Accelerators for Muon Acceleration and Cancer Therapy

Thursday 30 July 2009 14:00 (30 minutes)

A new concept in non-scaling FFAGs has been invented in which the machine tune is stable over an extended acceleration cycle, a factor of a 3-6, or more, in momentum. Fermilab Research Association (FRA) has elected to patent this concept and a strong collaborative design effort to optimize, simulate, and demonstrate the technical feasibility of this accelerator approach is underway to be followed by an engineering design. Sophisticated simulation tools within the advanced accelerator simulation code, COSY INFINITY, have been developed to fully and accurately describe the FFAG' s complex electromagnetic fields - including realistic edge-field effects and high-order dynamics. Predicted performance showed the promised tune stability, and a sustainable slow acceleration rate by a modest acceleration system. The new nonscaling variant retains important features of the synchrotron: smaller radial aperture, variable energy, and kicker and resonant extraction, yet has the high curr ent advantage of the cyclotron.

Author: JOHNSTONE, Carol (Fermi National Accelerator Laboratory)

Presenter: JOHNSTONE, Carol (Fermi National Accelerator Laboratory)

Session Classification: Accelerators III

Track Classification: Accelerator Physics

Contribution ID: **357** Type: **not specified**

Test of the viscous hydrodynamic paradigm for RHIC

Thursday 30 July 2009 15:45 (30 minutes)

The past couple years have seen a lot of progress in the application of causal dissipative hydrodynamics to model heavy-ion collisions at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. These advances benefited greatly from breakthrough results obtained in the gravity (AdS/CFT) dual of theories based on N=4 supersymmetric Yang-Mills. 2+1D viscous hydrodynamic calculations have now converged between the various groups, and the shear viscosity to entropy density ratio has been estimated from RHIC data. The results are roughly comparable with the AdS/CFT bounds (eta/s)_min = ˜0.1, an order of magnitude below perturbative QCD estimates. I will review some of this progress in the first part of my talk.

It is, however, important to realize that viscous hydrodynamics, even the second-order formulations (such as Israel-Stewart theory), is only an approximation with a certain region of validity. Relaxation towards local equilibrium competes with the rapid longitudinal and later also transverse expansion of the heavy-ion system. I will report on investigations of this relaxation-expansion competition in a nonequilibrium theory framework, covariant transport. These studies find that Israel-Stewart hydrodynamics is only accurate for RHIC applications when eta/s < ˜few * 0.1. A useful rule of thumb is that hydrodynamics becomes inaccurate when dissipative corrections to pressure and entropy exceed about 20%. If bulk viscosity plays a significant role in the dynamics, the additional entropy generation further constrains the applicability of hydrodynamics.

Most of the above results center on the transverse momentum anisotropy (so called “elliptic flow”) observable. Conical flow generated by a supersonic source has also been proposed as a sensitive experimental probe of thermalization AND very low viscosities. In the third part of my talk I will show, from covariant transport, what it takes to generate conical flow. Finally, I will finish up with a discussion of key open problems that need to be tackled in order to reliably estimate the shear viscosity at RHIC from heavy-ion data.

Author: MOLNAR, Denes (Purdue University and RIKEN BNL Research Center)

Presenter: MOLNAR, Denes (Purdue University and RIKEN BNL Research Center)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **358** Type: **not specified**

Measurement of Forward-Backward Asymmetry in Top Quark Production at CDF

Monday 27 July 2009 17:00 (15 minutes)

We measure a forward-backward charge asymmetry in the rapidities of top quarks produced in $p\bar{p}$ collisions at $\sqrt{s}$=1.96 TeV. The $t\bar{t}$ kinematics are reconstructed in ˜800 lepton+jets events collected in a 3 fb^{-1} exposure with CDF detector at Fermilab. We present two independent techniques – a model independent unfold and a likelihood fit to a linear asymmetry in the production angle $(1 + Acos(\alpha))$ – that give consistent results for the parton level asymmetry in both the laboratory and $t\bar{t}$ rest frames. The results are compared to the small charge asymmetry expected in QCD at NLO.

Author: Mr STRYCKER, Glenn (University of Michigan)

Presenter: Mr STRYCKER, Glenn (University of Michigan)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **359** Type: **not specified**

Identification of Extra Neutral Gauge at the LHC

Thursday 30 July 2009 16:50 (20 minutes)

s-channel resonances are predicted by many models of Physics Beyond the Standard Model and it is quite possible that such an object will be discovered in the early years of the LHC program. If this occurs, the task will be to understand its origins. I will describe various diagnostic measurements to study Z' 's including some new observables we have proposed that can distinguish between models that take advantage of the ability to tag 3rd generation fermions.

Author: GODFREY, Stephen (Carleton University)

Co-authors: DIENER, Ross (Carleton University); MARTIN, Travis (Carleton University)

Presenter: GODFREY, Stephen (Carleton University)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **360** Type: **not specified**

Top Jets and Substructure at LHC

Monday 27 July 2009 14:40 (15 minutes)

Study of high-pt jets from QCD and from highly-boosted massive particles such as tops, W, Z and Higgs, and argue that infrared-safe observables can help reduce QCD backgrounds. Jets from QCD are characterized by different patterns of energy flow compared to the products of highly-boosted heavy particle decays, and we employ a variety of jet shapes, observables restricted to energy flow within a jet, to explore this difference. Results from Monte Carlo generators and arguments based on perturbation theory support the discriminating power of the shapes we refer to as planar flow and angularities. We emphasize that for massive jets, these and other observables can be analyzed perturbatively.

Author: Mr ALMEIDA, Leandro (Stony Brook University)

Presenter: Mr ALMEIDA, Leandro (Stony Brook University)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **361** Type: **not specified**

Anisotropic collective phenomena in ultra-relativistic nuclear collisions

Thursday 30 July 2009 15:15 (30 minutes)

Recent developments in the field of anisotropic flow, measurements and interpretations, are reviewed with an emphasis on relation to the bulk properties of the medium.

Author: Prof. VOLOSHIN, Sergei (Department of Physics and Astronomy-College of Science-Wayne Sta)

Presenter: Prof. VOLOSHIN, Sergei (Department of Physics and Astronomy-College of Science-Wayne Sta)

Session Classification: Heavy Ions II

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **362** Type: **not specified**

CP Violating Anomalous top quark couplings at the LHC

Monday 27 July 2009 15:10 (15 minutes)

We study the T odd correlations induced by CP violating anomalous top quark couplings at both production and decay level in the process gg –> t t_bar –> (b mu+ nu_mu) (b_bar mu- nu_mu_bar). We consider several counting asymmetries at the parton level and find the ones with the most sensitivity to each of these anomalous couplings at the LHC.

Authors: VALENCIA, German (Iowa State); METE, Serhan (Iowa State); GUPTA, Sudhir (Iowa State)

Presenter: GUPTA, Sudhir (Iowa State)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **363** Type: **not specified**

Tevatron Collider Status and Prospects

Thursday 30 July 2009 15:00 (30 minutes)

The Tevatron proton-antiproton collider at Fermilab continues operation as the world's highest energy particle accelerator by delivering luminosity at a center-of-mass energy of 1.96 TeV. We review recent performance and plans for the remainder of Run 2.

Author: Dr MOORE, Ronald (Fermi National Accelerator Laboratory)

Presenter: Dr MOORE, Ronald (Fermi National Accelerator Laboratory)

Session Classification: Accelerators III

Track Classification: Accelerator Physics

Contribution ID: **364** Type: **not specified**

Testing Neutrino Physics with Colliders

Thursday 30 July 2009 14:30 (25 minutes)

The Majorana nature of neutrinos can be experimentally verified only via lepton-number violating processes involving charged leptons. The unambiguous signal of Majorana neutrinos can be probed in many low energy experiments such as study of beta decay spectra, accelerator based experiments such as decays of taus and mesons and collider experiments with direct production and decay. These decays are absent in the Standard Model but, in the presence of Majorana neutrinos in the appropriate mass range the rates for these processes would be enhanced due to their resonant contribution. The wide range of experiments probe neutrino masses over many orders of magnitude and place stringent constraints on the mass and mixing of neutrinos in the case of non-observation. In this talk we review the many promising probes of neutrino physics.

Author: Dr ATRE, Anupama (Fermilab)

Presenter: Dr ATRE, Anupama (Fermilab)

Session Classification: Neutrino Physics III

Track Classification: Neutrino Physics

Contribution ID: **365** Type: **not specified**

A New High-Sensitivity Search for Muon-to-Electron Conversion at FNAL

Friday 31 July 2009 16:40 (25 minutes)

The Mu2e collaboration is proposing to search for coherent, neutrino-less conversion of muons into electrons in the field of a nucleus with a sensitivity improvement of approximately 10,000 over existing limits. Such a lepton flavor-violating reaction probes new physics at a scale unavailable by direct searches at either present or planned high energy colliders. The physics motivation for Mu2e and the design of the muon beamline and spectrometer will be presented, along with a scheme by which the experiment can be mounted in the present Fermilab accelerator complex. We will also examine the prospects for increased sensitivity of as much as two orders-of-magnitude at the proposed Fermilab Project X Linac.

Author: BERNSTEIN, robert (Fermilab)

Presenter: NORMAN, Andrew (Univeristy of Virginia)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **366** Type: **not specified**

Searching for New Physics at the LHC with Top Quarks

Monday 27 July 2009 14:00 (40 minutes)

The LHC at design luminosity will generate 80 million top quark pairs which can be suitably tagged by the experimental collaborations. Because of the close connection between the electroweak symmetry breaking scale and their mass, these top quarks can be used as a probe of new physics at the LHC. In this talk, we review what new physics can be potentially discovered with top quark pairs during the early days of LHC running. We also discuss some new physics scenarios in which the top pairs play a crucial role.

Author: Dr DEVIN, Walker (University of California - Berkeley)

Presenter: Dr DEVIN, Walker (University of California - Berkeley)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **367** Type: **not specified**

Hydro and HBT for RHIC

Tuesday 28 July 2009 14:50 (25 minutes)

I will review how two-particle correlations, or Hanbury-Brown Twiss (HBT) measurements, are providing detailed tests of the hydrodynamic evolution of heavy ion collisions at RHIC. The talk will focus on how hydrodynamics is implemented for this kind of physics and how the details of the implementation can affect final-state observables, especially HBT.

Author: Dr PRATT, Scott (Michigan State University)

Co-author: Mr VREDEVOOGD, Josh (Michigan State University)

Presenter: Dr PRATT, Scott (Michigan State University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **368** Type: **not specified**

A phenomenological study of photon production in low energy neutrino nucleon scattering

Tuesday 28 July 2009 17:30 (15 minutes)

Low energy photon production is an important background to many current and future precision neutrino experiments. I present a phenomenological study of t-channel radiative corrections to neutral current neutrino nucleus scattering. After introducing the relevant processes and phenomenological coupling constants, I will explore the derived energy and angular distributions as well as total cross section predictions along with their estimated uncertainties. This is supplemented throughout with comments on possible experimental signatures and implications. I conclude with a general discussion of the analysis in the context of complimentary methodologies.

Author: Dr JENKINS, James (Los Alamos National Laboratory)

Presenter: Dr JENKINS, James (Los Alamos National Laboratory)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **369** Type: **not specified**

Particle Physics with Astrophysical Neutrino Detectors

Thursday 30 July 2009 14:00 (25 minutes)

The search for astrophysical neutrinos has given rise to a new generation of neutrino telescopes of an unprecedented scale, including IceCube, ANTARES and ANITA. While these instruments are, first and foremost, astronomical observatories, they also occupy a unique niche in the field of particle physics. These detectors may offer a glimpse of high energy neutrinos that reach us over cosmological distances. In addition, the atmospheric neutrino flux may be used as a test beam for long baseline oscillation studies which will be sensitive to flavor induced neutrino oscillations, such as those expected if Lorentz invariance were violated at very small scales. These instruments may also be employed in the indirect detection of WIMPs and the search for exotic phenomena such as magnetic monopoles. Here I will review the capability of these observatories from the perspective of a particle physicist.

Author: Prof. HOFFMAN, Kara (UMD)

Presenter: Prof. HOFFMAN, Kara (UMD)

Session Classification: Neutrino Physics III

Track Classification: Neutrino Physics

Contribution ID: **370** Type: **not specified**

The NOvA Experiment

Monday 27 July 2009 17:50 (15 minutes)

The NOvA Experiment is a new accelerator based, long baseline, neutrino oscillation experiment which is beginning construction at Fermilab. NOvA is designed to probe with new precisions and sensitivities the theta_13 and theta_23 mixing angles of the PMNS matrix, while simultaneously having significant sensitivity to the CP violating phase delta and resolution of the neutrino mass hierarchy. The experimental sensitivities of NOvA, as wells as the advances in the experimental design of the NOvA detectors and the overall project status will be presented.

Author: NORMAN, Andrew (University of Virginia)

Presenter: NORMAN, Andrew (University of Virginia)

Session Classification: Neutrino Physics I

Track Classification: Neutrino Physics

Contribution ID: **371** Type: **not specified**

Underlying Event Studies at RHIC

Tuesday 28 July 2009 15:15 (25 minutes)

By studying p-p collisions we hope to improve our understanding of the fundamental constituents of matter and how they form into colorless objects. Measurements of the inclusive jet cross-sections and fragmentation properties have confirmed that QCD based calculations give a good description of the hard scattering processes. However, as our analysis of jets has improved it has become clear that there is significant contribution to these measurements from something other than the hard scattering - the so-called underlying event. Several processes contribute to the underlying event, namely the beam-beam remnants, and initial and final state radiation. The structure of the jet and the underlying event are strikingly different in both their particle compositions and momentum distributions. Only by understanding both components can we fully describe a p-p collision.

I will discuss preliminary results from studies of the underlying event in p-p collisions at sqrt(s) = 200 GeV at RHIC, and compare to PYTHIA predictions as well as earlier results from the Tevatron at 1.96 TeV.

Author: CAINES, Helen Louise (Yale University)

Presenter: CAINES, Helen Louise (Yale University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **372** Type: **not specified**

High Energy Astrophysics with the Fermi Large Area Telescope

Monday 27 July 2009 14:00 (25 minutes)

The Fermi Gamma-ray Space Telescope has been surveying the gamma-ray sky since August 2008. The Large Area Telescope detects gamma rays over a wide field of view, ˜2.4 sr, across a broad energy range, from ˜20 MeV to above 300 GeV, and with excellent angular resolution, 68% containment of better than 1 deg at 1 GeV. The capabilities of the LAT have opened a new window for exploring high energy astrophysics. I will present highlights from the broad variety of science being conducted, including the study of outbursts from blazar galaxies, the discovery of a new population of gamma-ray emitting pulsars, the detections of high energy emission from gamma-ray bursts, and the observation of supernova remnants and compact binary systems within our Galaxy.

Author: HAYS, Elizabeth (NASA/GSFC)

Presenter: HAYS, Elizabeth (NASA/GSFC)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **373** Type: **not specified**

Media Training

Tuesday 28 July 2009 16:20 (1h 30m)

Kathryn Grim
Media Training
If you watched the Daily Show's feature on the Large Hadron Collider in May, you will remember the look on John Ellis'face when John Oliver asked him, "Evilgeniussayswhat?" It's impossible to anticipate everything a reporter will ask you, but this media training will teach you how to prepare for interviews with print, television or radio journalists and increase your understanding of how to effectively communicate through the media.

Kathryn Grim of the Fermilab Office of Communication will provide a general overview of how the media works, what makes news and why. She will explain the importance of key messages, analogies and sound bites and conduct some exercises on how to craft them. By the end of the session, you will understand the importance of preparing for media interactions, gain clarity on how to successfully present your work, and understand where to go for assistance in dealing with the media, just in case the Daily Show ever comes knocking on your door.

Author: Ms GRIM, Kathryn (Fermilab)

Presenter: Ms GRIM, Kathryn (Fermilab)

Session Classification: Education and Outreach in HEP

Track Classification: Education and Outreach in HEP

Contribution ID: **374** Type: **not specified**

Angels and Demons

Tuesday 28 July 2009 14:00 (20 minutes)

Elizabeth Clements
Angels & Demons: The real story behind the lecture nights
On May 15, Sony Pictures released Angels & Demons, a major motion picture based on Dan Brown' s best–selling novel. Starring Tom Hanks and directed by Ron Howard, the film focuses on an apparent plot to destroy the Vatican using antimatter made at the Large Hadron Collider and stolen from CERN. Through a series of public lectures, scientists used this opportunity to tell the world about the real science of antimatter, the Large Hadron Collider and the excitement of particle physics research. In the months of May and June, more than 60 lectures took place at universities, laboratories and other venues in the U.S., Canada and Europe. Nearly 5,000 people attended the lectures in the U.S. and Canada alone. My talk will go behind the scenes and outline how the Fermilab Office of Communication and the CERN Press Office organized the lecture nights. I will highlight lessons learned and how we can use the Angels & Demons lecture nights as an example to plan future successful public outreach activities.

Author: Prof. PITTS, Kevin (University of Illinois)

Presenter: Prof. PITTS, Kevin (University of Illinois)

Session Classification: Education and Outreach in HEP

Track Classification: Education and Outreach in HEP

Contribution ID: **375** Type: **not specified**

Drell-Yan processes at hadron colliders

Tuesday 28 July 2009 14:00 (30 minutes)

The production of a pair of high-transverse-momentum leptons plays a very important role at hadron colliders:
it allows the precise measurement of basic parameters of the Standard Model like the masses and decay widths of the W and Z bosons and the weak mixing angle; it provides stringent constraints on the parametrization of the proton parton density functions; it could provide a tool to monitor the collider luminosity; it is an important background to the searches for new physics signals.
The present status of the theoretical predictions for the inclusive lepton-pair production cross-sections will be reviewed considering QCD and EW corrections and their interplay.
The implementation of these corrections in Monte Carlo event generators and the implications for the precise measurement of the W boson mass will be discussed.

Author: Dr VICINI, Alessandro (Department of Physics, University of Milano)

Presenter: Dr VICINI, Alessandro (Department of Physics, University of Milano)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **376** Type: **not specified**

Search for the Rare Decay Kl->pi0nunubar at E391a Experiment

Thursday 30 July 2009 14:30 (25 minutes)

The E391a experiment at the KEK 12 GeV proton synchrotron is the first dedicated experiment for the Kl->pi0nunubar decay. The data is taken during three separate Runs. We just performed a blind analysis on the last Run. With (3.48+-0.25)*10^9 Klong decays, we found no candidate events. An upper limit of 6.8*10^-8 was set on the branching ratio for the decay at the 90% confidence level.

Author: MA, Jiasen (The University of Chicago)

Presenter: MA, Jiasen (The University of Chicago)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **377** Type: **not specified**

Non-Oscillation Neutrino Physics Experiments

Friday 31 July 2009 14:00 (25 minutes)

I will review the current status and outlook of prominent non-oscillation neutrino physics experiments, including neutrinoless double-beta decay searches and kinematic measurements of neutrino mass.

Author: Dr DETWILER, Jason (Lawrence Berkeley National Laboratory)

Presenter: Dr DETWILER, Jason (Lawrence Berkeley National Laboratory)

Session Classification: Neutrino Physics IV

Track Classification: Neutrino Physics

Contribution ID: **379** Type: **not specified**

Measurement of top pair spin correlation using CDF data

Monday 27 July 2009 16:45 (15 minutes)

According to standard model top quarks decay weakly before any hadronization processes take effect.
This enables top quark spin information to be transmitted to the top quark decay products.
We discuss the measurement method for various decay channels and report first result for spin correlation in top pairs using dilepton events.

Author: Dr VARGANOV, Alexei (the University o Michigan)

Presenter: Dr VARGANOV, Alexei (the University o Michigan)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **380** Type: **not specified**

Probing the Quark-Gluon Phase Transition with Correlations and Fluctuations in Heavy Ion Collisions from the STAR Experiment

Tuesday 28 July 2009 15:40 (25 minutes)

The measurement of particle correlations and fluctuations has been suggested as a method to search for the existence of a phase transition in relativistic heavy ion collisions. A change in the observed fluctuations is expected in global quantities such as baryon number, strangeness, or charge near a QCD critical point or a first order phase transition.

Results for short and long-range multiplicity correlations (forward-backward) are presented for several systems (Au+Au, Cu+Cu, and pp) and energies (e.g. $\sqrt{s_{NN}}$ = 200 and 62.4 GeV). For the highest energy central A+A collisions, the correlation strength maintains a constant value across the measurement region. In peripheral collisions, at lower energies, and in pp data, the maximum appears at midrapidity. Results for K/pi and p/pi fluctuations are also shown as a function of centrality and collision energy.

Comparison to models with short-range (HIJING) and both short and long-range interactions (Parton String Model) do not fully reproduce central Au+Au data. This result may indicate a reduction in number of particle sources for central Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV and the possible formation of high density matter.

Author: TARNOWSKY, Terence (Michigan State University)

Presenter: TARNOWSKY, Terence (Michigan State University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **381** Type: **not specified**

Highlights of Gamma-ray Astronomy with VERITAS

Monday 27 July 2009 14:25 (25 minutes)

The Very Energetic Radiation Imaging Telescope Array System (VERITAS) provides unprecedented flux sensitivity in the energy regime 100 GeV - 30 TeV to the northern hemisphere gamma-ray sky. The array consists of four 12 m class imaging atmospheric Cherenkov telescopes and is located at Whipple Observatory in southern Arizona. VERITAS addresses a wide range of astrophysical phenomena including searches for dark matter annihilation, the origin of cosmic rays, black holes and relativistic jets, and the extragalactic background light. VERITAS has been operating with a complete array since the fall of 2007. This talk will review some of the exciting new results from VERITAS, including detailed studies of galactic supernova remnants, discovery of variability in an unidentified TeV source (HESS J0632+057), establishment of a new class of very-high-energy emitting blazars, and evidence of particle acceleration associated with the central black hole in the radio galaxy M87. In addition, VERITAS has placed upper limits on the flux of gamma rays from the annihilation of dark matter in nearby dwarf galaxies.

Author: HUMENSKY, Brian (University of Chicago)

Presenter: HUMENSKY, Brian (University of Chicago)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **382** Type: **not specified**

Alignment of the CMS Muon System with Tracks

Tuesday 28 July 2009 16:55 (25 minutes)

As its name suggests, the Compact Muon Solenoid (CMS) features a full tracking spectrometer for identifying and measuring the momenta of muons. Every muon passes through 18-44 layers, providing a highly redundant track capable of validating and improving the momentum measurement from the inner tracker. But like any tracking system, its performance depends on precise knowledge of the positions of the tracking elements relative to one another and relative to the central CMS silicon tracker. We present methods to align the muon system with tracks and the performance of these algorithms using cosmic rays and beam-halo data from the 2008 run of the LHC.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: Dr PIVARSKI, Jim (Texas A&M University)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **383** Type: **not specified**

The fate of black branes in Einstein-Gauss-Bonnet gravity

Friday 31 July 2009 15:20 (20 minutes)

Black branes are studied in Einstein-Gauss-Bonnet (EGB) gravity. Evaporation drives black branes towards one of two singularities depending on the sign of α, the Gauss-Bonnet coupling. For positive α and sufficiently large ratio $\sqrt{\alpha}/L$, where $L/2\pi$ is the radius of compactification, black branes avoid the Gregory-Laflamme (GL) instability before reaching a critical state. No black branes with the radius of horizon smaller than the critical value can exist. Approaching the critical state branes have a nonzero Hawking temperature. For negative α all black branes encounter the GL instability. No black branes may exist outside of the interval of the critical values, $0 \leq \beta < 3$, where $\beta = 1 - 8\alpha/r_h^2$ and r_h is the radius of horizon of the black brane. The first order phase transition line of GL transitions ends in a second order phase transition point at $\beta = 0$.

Summary

arXiv:0810.0525v2 [hep-th]
To appear in Phys.Rev.D.
Authors P.Suranyi, C.Vaz and L.C.R.Wijewardhana

Author: Prof. WIJEWARDHANA, L.C.R. (University of Cincinnati)

Co-authors: Prof. VAZ, Cenalo (University of Cincinnati); Prof. SURANYI, Peter (University of Cincinnati)

Presenter: Prof. WIJEWARDHANA, L.C.R. (University of Cincinnati)

Session Classification: String & Field Theory

Track Classification: Field and String Theory

Contribution ID: **384** Type: **not specified**

Interpreting new CP violating signals in B Decays

Monday 27 July 2009 14:00 (30 minutes)

I will describe several CP violating signals in B decays like direct CP violation, mixing induced CP violation and Triple Product Asymmetry. I will discuss CP violating measurements involving b-> s transitions. I will particularly focus on measurements made on penguin decays like B-> phi K_s, B-> K pi and on B_s mixing.

Author: DATTA, Alakabha (University of Mississippi)

Presenter: DATTA, Alakabha (University of Mississippi)

Session Classification: CP-violation I

Track Classification: CP-violation

Contribution ID: **386** Type: **not specified**

Electroweak corrections to b-jet and di-jet production

Friday 31 July 2009 14:20 (20 minutes)

Simultaneously with the turning-on of the Large Hadron Collider (LHC) the data taking for jet production rates will start. The study of these production rates is one of the important tests of the Standard Model in the new energy regime available at the LHC. In order to discriminate possible extensions of the Standard Model accurate theoretical predictions are needed. In this talk I will present the electroweak next-to-leading order corrections
to b-jet and di-jet production and show their impact on differential distributions.

Author: Dr SCHARF, Andreas (University at Buffalo)

Co-authors: Prof. KUEHN, Johann H. (University Karlsruhe (Germany)); Prof. UWER, Peter (Humboldt University Berlin (Germany))

Presenter: Dr SCHARF, Andreas (University at Buffalo)

Session Classification: Electroweak Physics III

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **387** Type: **not specified**

Planck Scale Cosmology and Resummed Quantum Gravity

Tuesday 28 July 2009 17:40 (20 minutes)

We show that, by using amplitude-based resummation techniques for Feynman's formulation of Einstein's theory, we get quantum field theoretic predictions for the UV fixed-point values of the dimensionless gravitational and cosmological constants. Connections to the phenomenological asymptotic safety analysis of Planck scale cosmology by Bonanno and Reuter are discussed.

Author: Dr WARD, Bennie (Baylor University)

Presenter: Dr WARD, Bennie (Baylor University)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **388** Type: **not specified**

HERWIRI1.0: MC Realization of IR-Improvement for DGLAP-CS Parton Showers

Thursday 30 July 2009 15:35 (25 minutes)

In the context of HERWIG6.5, we present Monte Carlo data showing the comparison between the parton shower generated by the standard DGLAP-CS kernels and that generated by the new IR-improved DGLAP-CS kernels recently developed by one of us(BFLW). This is done by implementing the new kernels in HERWIG6.5 to generate a new MC, HERWIRI1.0, for hadron-hadron interactions at high energies. Possible implications for LHC phenomenology and comparisons with FNAL data are also discussed.

Author: Dr WARD, Bennie (Baylor University)

Co-authors: Dr JOSEPH, Samuel (Baylor University); Mrs YOST, Scott (The Citadel); Dr MAJHI, Swapan (Saha Institute, Kolkata, In)

Presenter: Dr WARD, Bennie (Baylor University)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **389** Type: **not specified**

Commissioning of the CMS Endcap Muon System

Tuesday 28 July 2009 16:30 (25 minutes)

The CMS detector is a general-purpose particle detector centered on one of the interaction points at the LHC. On the endcaps of the detector, interspersed between iron disks that serve as a return yoke for the detector's solenoidal magnetic field, are mounted 468 cathode strip chambers (CSCs). These chambers will serve as a trigger and spectrometer for muons generated in high-energy proton-proton collisions. Because of the feature of muons in many new physics processes, and their cleanly identifiable signature in the outer layers of the detector, it is of the utmost importance that the CSCs produce the highest quality data possible when beam arrives. This talk summarizes the current status of the CSC commissioning effort in the areas of hardware, software, and alignment, using data from cosmic rays and Monte Carlo detector simulations.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: Mr KILLEWALD, Phillip (The Ohio State University)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **390** Type: **not specified**

Hadron spectroscopy results from Belle

Tuesday 28 July 2009 14:00 (35 minutes)

Using a large data sample recorded with the Belle detector
at the KEKB asymmetric energy eˆ+ eˆ- collider,
we report new results on charmonium-like states
produced in gamma-gamma collisions including studies of
final states with multiple
kaons. We also report updates on other new particles
and resonances recently observed in B decays by Belle.

Authors: Prof. BROWDER, Tom (University of Hawaii); ZUPANC

Presenter: Dr ZUPANC, Anze

Session Classification: Hadron Spectroscopy I

Track Classification: Hadron Spectroscopy

Contribution ID: **391** Type: **not specified**

Challenges for Multi-Megawatt Neutrino Beamlines

Monday 27 July 2009 14:00 (30 minutes)

This is a talk on the challenges of beamlines and targeting for neutrino production using multi-megawatt beamlines. Discussed are lessons from NuMI operations at Fermilab and concerns related to future and proposed beamlines such as NOvA, CNGS, JPARC, and LBNE.

Author: MARTENS, Michael (Fermilab)

Presenter: MARTENS, Michael (Fermilab)

Session Classification: Accelerators I

Track Classification: Accelerator Physics

Contribution ID: **392** Type: **not specified**

Searches for Supersymmetry Signatures at the LHC

Tuesday 28 July 2009 14:00 (40 minutes)

Supersymmetry (SUSY) is one of the most attractive extentions of the Standard Model. If SUSY exist in nature it can be discovered at the LHC if SUSY particles have masses at sub-TeV range. SUSY discovery strategies with early data by the ATLAS and CMS experiments are presented. SUSY mass and parameter measurements are also demonstrated.

Author: OZTURK, Nurcan (University of Texas at Arlington)

Presenter: OZTURK, Nurcan (University of Texas at Arlington)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **393** Type: **not specified**

Top Quark Phenomenology with D-Dimensional Generalized Unitarity

Tuesday 28 July 2009 14:00 (15 minutes)

The production of top quark pairs at hadron colliders is an important process for understanding QCD dynamics and is sensitive to new physics. The data collected at the Tevatron and the sizable cross section at the Large Hadron Collider allow for precision measurements. To match the experimental precision, radiative corrections must be included in the theory predictions.

We present results for the NLO QCD corrections to the production and decay of top quark pairs, retaining all spin correlations. The calculation is done within the novel method of D-dimensional generalized unitarity and implemented in a numerical program which allows detailed studies of differential distributions. Furthermore, we present preliminary NLO results for the production and decay of top quark pairs in addition with a hard jet.

Author: Dr SCHULZE, Markus (Johns Hopkins University)

Co-author: Prof. KIRILL, Melnikov (Johns Hopkins University)

Presenter: Dr SCHULZE, Markus (Johns Hopkins University)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **394** Type: **not specified**

Understanding Lepton Mixing

Tuesday 28 July 2009 14:00 (25 minutes)

This talk will provide an overview of theoretical models of neutrino masses and lepton mixing angles.

Author: Prof. EVERETT, Lisa (University of Wisconsin)

Presenter: Prof. EVERETT, Lisa (University of Wisconsin)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **395** Type: **not specified**

Measurements of Top Quark Production at CDF

Tuesday 28 July 2009 14:15 (20 minutes)

The top quark is the heaviest particle yet observed. With the possibility for the massive top to couple to new physics at high energy scales, CDF has many complementary analyses in each top decay channel which provide strong tests of the standard model and physics beyond. With several fb-1 of data now accumulated at CDF, we are able to measure the top pair production rate with unprecedented precision, and uncertainties comparable to those of theoretical predictions. In this talk we present measurements of the top production cross section in all the decay channels along with their combined result. In addition, the first measurement of the cross section of t-tbar associated with an additional hard jet (tt+jet) will be presented. The measurement is a test of NLO calculations as well as an important first step to understanding top at the LHC, where almost all top is produced as tt+jet.

Author: Dr SCHWARZ, Thomas Andrew (University of California (UCD))

Presenter: Dr SCHWARZ, Thomas Andrew (University of California (UCD))

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **396** Type: **not specified**

Superconducting RF Cavity Topics

Tuesday 28 July 2009 18:00 (30 minutes)

Abstract to appear here

Author: Dr GINSBURG, Camille (Fermi National Accelerator Laboratory)

Presenter: Dr GINSBURG, Camille (Fermi National Accelerator Laboratory)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **397** Type: **not specified**

Accelerator Preparations for Muon Physics Experiments at Fermilab

Tuesday 28 July 2009 15:30 (30 minutes)

Author: Dr SYPHERS, Michael (Fermi National Accelerator Laboratory)

Presenter: Dr SYPHERS, Michael (Fermi National Accelerator Laboratory)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **400** Type: **not specified**

Challenges in Beam Instrumentation

Tuesday 28 July 2009 17:30 (30 minutes)

Recent and upcoming particle accelerators for HEP, as well as for applied science demand a very high beam quality, e.g. high beam power in the multi MW range, focused beams at the IP to a size of a few nm, fsec range bunch length, low beam halo and tails, high beam stability, etc. To characterize, verify and improve these beam parameters, advances in beam instrumentation and diagnostics are mandatory. The challenges for state-of-the-art beam instruments are presented by various R&D examples with respect to hadron and lepton accelerator projects.

Author: WENDT, Manfred (Fermi Naional Accelerator Laboratory)

Presenter: WENDT, Manfred (Fermi Naional Accelerator Laboratory)

Session Classification: Accelerators II

Track Classification: Accelerator Physics

Contribution ID: **401** Type: **not specified**

Recent Results from IceCube and AMANDA

Tuesday 28 July 2009 16:30 (25 minutes)

IceCube is a cubic kilometer neutrino telescope under construction at the South Pole, a successor to the first-generation AMANDA telescope. IceCube is now three quarters complete, with completion expected in early 2011, and data taken with the partially built detector already provides a sensitivity surpassing the complete AMANDA-II data set. Results from searches for astrophysical sources of neutrinos and for evidence of dark matter with both AMANDA and IceCube will be shown. We will also discuss plans for Deep Core, an enhancement of IceCube designed to extend its sensitivity to neutrinos below the TeV scale.

Author: DEYOUNG, Tyce (Pennsylvania State University)

Presenter: DEYOUNG, Tyce (Pennsylvania State University)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **402** Type: **not specified**

Measuring the BR(K+->pi+nu nubar) with the NA62 experiment at CERN

Thursday 30 July 2009 15:30 (25 minutes)

The NA62 experiment is designed to measure the BR of the very rare kaon decay K+->pi+nu nubar collecting order 100 events with 10% of background in two years of data taking. The poor current experimental knowledge of this decay, based on 7 events collected by the E787/949 experiments, from one side, and the good theoretical prediction on the other side, make this new measurement very appealing. The experiment set-up and the description of the detectors that are going to be installed will be described.

Author: Dr SARACINO, Giulio (Univ. Degli Studi di Napoli Federico II)

Presenter: Dr SARACINO, Giulio (Univ. Degli Studi di Napoli Federico II)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **403** Type: **not specified**

The Pierre Auger Cosmic Ray Observatory, South and North: Recent Results and Plans for the Future

Monday 27 July 2009 14:50 (25 minutes)

The Pierre Auger Observatory is the world's largest detector for the highest energy cosmic rays. The astrophysical origins of these particles have remained a persistent mystery for decades. However, recent results from Auger indicate that we may be on the threshold of a new understanding. The Pierre Auger Observatory, in Malargue, Argentina, has been operating since 2004. We describe the latest results from Auger including measurement of the all-particle energy spectrum and limits on photon flux and tau neutrino flux. We also describe the current status of anisotropy analysis and progress towards composition measurements with possible connections to high energy particle physics. The results from the Auger experiment in Argentina motivate our current plans to deploy a new, larger detector in southeastern Colorado. We present a short summary of current plans and progress toward the development of Auger North.

Author: COVAULT, corbin (Case Western Reserve University)

Presenter: COVAULT, corbin (Case Western Reserve University)

Session Classification: Particle Astrophysics and Cosmology I

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **404** Type: **not specified**

Antiproton Production at Fermilab

Thursday 30 July 2009 15:30 (30 minutes)

Author: Dr NAGASLAEV, Vladimir (Fermi National Accelerator Laboratory)

Presenter: Dr NAGASLAEV, Vladimir (Fermi National Accelerator Laboratory)

Session Classification: Accelerators III

Track Classification: Accelerator Physics

Contribution ID: **406** Type: **not specified**

CP Violation and EDMs in an M-theory motivated SUSY breaking model

Friday 31 July 2009 17:10 (20 minutes)

We demonstrate that in effective theories arising from $calN = 1$ fluxless compactifications of M-theory on a G_2 manifold with low energy supersymmetry, CP-violating phases do not appear in the soft-breaking Lagrangian except via the Yukawas. Such a mechanism may be present in other string compactifications as well; we describe properties sufficient for this to occur. CP violation is generated via the Yukawas since the soft trilinear matrices are generically not proportional to the Yukawa matrices. Within the framework considered, the estimated theoretical upper bounds for electric dipole moments (EDM) of the electron, neutron and mercury are all within the current experimental limits and could be probed in the near future.

Author: SHAO, Jing (U of Michigan)

Presenter: SHAO, Jing (U of Michigan)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **407** Type: **not specified**

Leptogenesis and Its Electromagnetic Variant

Tuesday 28 July 2009 16:55 (25 minutes)

We briefly explain how the present baryon-antibaryon asymmetry of the universe could have arisen through leptogenesis, and then discuss a new version of leptogenesis in which CP violation in electromagnetic decays plays the central role.

Author: KAYSER, Boris (Fermilab)

Presenter: KAYSER, Boris (Fermilab)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **408** Type: **not specified**

Azimuthal charged particle correlations as a probe for local strong parity violation in heavy ion collisions

Tuesday 28 July 2009 16:30 (25 minutes)

One of the most interesting and important phenomena predicted
to occur in heavy ion collisions is the local strong parity violation.
In non-central collisions, it is expected to result in charge separation
of produced particles along the system's orbital momentum.
I will report on results of the charge separation measurement
in Au+Au and Cu+Cu collisions at sqrt{sNN} = 200 and 62 GeV
with the STAR detector at RHIC based on
three-particle mixed harmonic azimuthal correlations.
Systematic study of parity conserving (background) effects
with existing heavy ion event generators,
and their possible contributions to the observed
correlations will be also presented.

Author: Dr SELYUZHENKOV, Ilya (Indiana University)

Presenter: Dr SELYUZHENKOV, Ilya (Indiana University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **410** Type: **not specified**

Azimuthal correlation and anisotropic flow measurements from the PHENIX experiment at RHIC

Tuesday 28 July 2009 16:55 (25 minutes)

An important goal of the experiments at the Relativistic Heavy Ion Collider (RHIC) is to produce and study the hot and dense matter produced in heavy-ion collisions. To this effect, several probes are used to infer the properties of the matter formed. Two such probes are jets produced in hard scattering processes and anisotropic flow from pressure gradients which develop in the expanding system. It has been found that back-to-back angular correlations of high p_T hadrons from jets are suppressed in the most central Au+Au collisions due to partons losing energy as they traverse the dense medium. Anisotropic flow measurements, which carry information about the conditions during the early stages of the collisions, compare well with hydrodynamic models and their scaling patterns can help elucidate the dynamics of the evolution of the system. In this talk, I will present a brief overview of azimuthal correlation and anisotropic flow measurements from the PHENIX experiment and discuss what they indicate about the properties of the matter formed at RHIC.

Author: ISSAH, Michael (Vanderbilt University)

Presenter: ISSAH, Michael (Vanderbilt University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **411** Type: **not specified**

The K0TO Experiment

Thursday 30 July 2009 15:00 (25 minutes)

The goal of the K0TO experiment at J-Parc is to discover and measure
the rate of the rare decay of the neutral KL into pi0 nu nubar .
This flavor changing neutral current decay
proceeds through second-order weak interactions.
Other, as yet undiscovered particles, which can mediate the decay could
provide an enhancement to the branching ratio,
which in the Standard Model predicted to be about (2.8 +/- 0.4)*10*(-11).
The experiment is expected to observe 100 events
at the Standard Model branching ratio for a 10% measurement.
The experiment is a follow-up to E391 at KEK with a completely redesigned
beamline, a new CsI calorimeter with increased granularity and
reduced shower leakage,
and a new readout electronics, trigger and data acquisition system.
K0TO is scheduled for a first engineering run at the end of 2010
and the first physics run in 2011.

Author: Dr TECCHIO, Monica (University of Michigan)

Presenter: Dr TECCHIO, Monica (University of Michigan)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **412** Type: **not specified**

Upgrade of CMS HCAL for SLHC

Thursday 30 July 2009 15:15 (25 minutes)

The Compact Muon Solenoid (CMS) detector is in the planning phase of a major upgrade in preparation for the upgrade of the Large Hadron Collider (LHC) to the Super-LHC (SLHC). The SLHC will feature a significant increase in the instantaneous luminosity, leading to up to 200 collisions per interaction. In addition, the sustained radiation from the initial phase of LHC operations will necessitate replacement of some parts of the detector. This talk will focus on the proposed upgrades to the Hadronic Calorimeter (HCAL). Research and development of photo-detectors and the active layer of the calorimeter is underway, and will lead to significantly improved performance as well as enable the detector to operate successfully in SLHC conditions. These new detector components in combination with upgraded trigger electronics improve the current trigger system and allow sustained operation in the the SLHC era. Proposed upgrades, progress in research and development, and physics impact of these upgrades will be discussed.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: CLARIDA, Warren James (Physics and Astronomy Department - University of Iowa)

Session Classification: Detectors I

Track Classification: Detector Technology and R&D

Contribution ID: **413** Type: **not specified**

Search for supersymmetry at the CMS in all-hadronic final state

Tuesday 28 July 2009 15:00 (20 minutes)

We present a search for supersymmetry (SUSY) in the fully hadronic final state with the CMS detector at the LHC.

This final state contains at least two jets and a significant transverse energy imbalance due to neutralinos escaping detection.
The background to all-hadronic signature arise from QCD multijet production, ttbar and electroweak boson+jet production.
These background can be estimated by utilizing a data-driven approach using events thus enabling a possible discovery of SUSY in the
early physics data. In addition to the generic search, we also present an analysis which utilizes a new quantity, alpha_T, constructed
exclusively from the transverse energies of the jets to effectively eliminate the QCD background.

Author: LUNGU, Gheorghe (Rockefeller University)

Presenter: LUNGU, Gheorghe (Rockefeller University)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **414** Type: **not specified**

Searching for Majorana Neutrinos in the Like-Sign Dilepton Final

Thursday 30 July 2009 16:30 (20 minutes)

The Standard Model can be extended to include massive neutrinos as observed in the recent oscillation experiments. Perhaps the most commonly studied model is the type-I seesaw mechanism. This model introduces a new neutrino with a Majorana nature with an unknown mass. In this study we present the potential for the discovery of a Majorana neutrino during the first year of data collection from the Large Hadron Collider. In the analysis we used muon triggers, muon isolation, jet energy corrections, b-tagging, and an examination of the combinatorial background. We conclude that the discovery potential can be reached in the first year of running at the LHC at 10 TeV startup collision energy with the CMS detector for the Majorana neutrino mass range near 100 GeV.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: CLARIDA, Warren James (Physics and Astronomy Department - University of Iowa)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **415** Type: **not specified**

Supernova neutrinos: time dependent oscillation features

Tuesday 28 July 2009 14:30 (25 minutes)

I will review the physics of flavor transformations of supernova neutrinos. I will then discuss time dependent features in the neutrino signal caused by the changing density profile in the explosion.

Author: FRIEDLAND, Alexander (Los Alamos National Laboratory)

Presenter: FRIEDLAND, Alexander (Los Alamos National Laboratory)

Session Classification: Neutrino Physics II

Track Classification: Neutrino Physics

Contribution ID: **416** Type: **not specified**

Probing the heavy flavor content in ttbar events and using ttbar events as a calibration tool at CMS

Monday 27 July 2009 15:40 (20 minutes)

Summary

In the framework of the standard model (SM), the Top quark is expected to decay to a W-boson and a b-quark 99.8% of the times due to the Cabibbo-Kobayashi-Maskawa (CKM) matrix element Vtb being close to unity. The current experimental limits from Tevatron on the measurement of Vtb from top pairs ttbar and single top production are consistent with the SM predictions. Higher energy of proton-proton collisions and larger top quark production cross section at the Large Hadron Collider (LHC) may provide an improved reach in the measurement of Vtb. We present two analyses dedicated to measure the ratio of branching ratios of the top quark using ttbar events with either one or two prompt isolated leptons (e or mu) in the final state. The sensitivity of the measurement with the CMS experiment is evaluated after particle identification and detector reconstruction. Data-driven techniques to control the background in the selected events are discussed and the expected simulation results are presented for the first physics run of LHC. We also discuss how the method can be used to measure directly from data the efficiency of the algorithms used to discriminate jets coming from the hadronization of b quarks from the lighter quarks and gluons (b-tagging).

Presenter: VOLPE, Roberta (INFN, Sezione di Perugia-Universita & INFN, Perugia-Unknown)

Session Classification: Top Quark Physics I

Contribution ID: **417** Type: **not specified**

Evolution of the ridge structure in RHIC heavy ion collisions

Friday 31 July 2009 14:00 (25 minutes)

Two particle correlation measurements at RHIC have shown an extended near side delta eta correlation in heavy-ion collisions relative to p+p for both momentum triggered and untriggered analyses. This phenomenon is also known as the "ridge". An investigation into the momentum dependence of two particle correlations is presented for Cu+Cu 200 GeV collisions from the STAR experiment. We extract the amplitude, eta and phi widths from the Gaussian near side correlation structure, and show how each extracted quantity depends on the lower transverse momentum cut-off. We then compare this evolution to predictions that attribute this correlation structure to a blast-wave expansion of a Color Glass Condensate initial state. Implications for the origin of the ridge will be discussed.

Author: Mr DE SILVA, Chanaka (Wayne State University)

Presenter: Mr DE SILVA, Chanaka (Wayne State University)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **418** Type: **not specified**

Indirect Dark Matter Search with VERITAS

Tuesday 28 July 2009 14:40 (20 minutes)

A leading candidate for astrophysical dark matter (DM) is a massive particle with a mass in the range from 50 GeV to greater than 10 TeV and an interaction cross section on the weak scale. The self-annihilation of such particles in astrophysical regions of high DM density can generate stable secondary particles including very high energy gamma rays with energies up to the DM particle mass. Dwarf spheroidal galaxies of the Local Group are attractive targets to search for the annihilation signature of DM due to their proximity and large DM content. We report on gamma-ray observations taken with the Very Energetic Radiation Imaging Telescope Array System (VERITAS) of several dwarf galaxy targets as well as the globular cluster M5 and the local group galaxies M32 and M33. We discuss the implications of these measurements for the parameter space of DM particle models.

Author: DICKHERBER, Ryan (Washington University in St. Louis)

Presenter: DICKHERBER, Ryan (Washington University in St. Louis)

Session Classification: Particle Astrophysics and Cosmology II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **419** Type: **not specified**

Top Mass Measurements with the D0 Detector

Tuesday 28 July 2009 17:40 (25 minutes)

We present recent results related to the measurement of the top quark mass using ppbar collisions recorded with the D0 Detector at the Tevatron. The results are: A direct measurement of the mass difference between top and antitop quarks (abstract 41), Measurement of the top quark mass in the leptons+jets channel (abstract 215) and in the di-lepton channel (abstract 218).

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: BOLINE, Daniel

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **420** Type: **not specified**

HERA measurements on proton structure

Thursday 30 July 2009 14:35 (35 minutes)

Recent results from the H1 and ZEUS experiment at HERA will be presented.

Author: Dr GLAZOV, Alexander (DESY)

Presenter: Dr GLAZOV, Alexander (DESY)

Session Classification: QCD I

Track Classification: Perturbative and Non-perturbative QCD

Contribution ID: **422** Type: **not specified**

The Final Measurement of ε´/ε from the KTeV Experiment

Thursday 30 July 2009 14:00 (30 minutes)

We will present the final measurement of the direct CP violation parameter, Re(ϵ´/ϵ), from the KTeV experiment at Fermilab. We will also describe precision measurements of the KL -KS mass difference, Δm, the KS lifetime, τS , and the CPT tests, ϕ+− and Δϕ. These results are based on the full dataset collected by the KTeV experiment at Fermi National Accelerator Laboratory during 1996, 1997, and 1999.

Author: BLUCHER, Edward (University of Chicago)

Presenter: Dr WORCESTER, Elizabeth (University of Chicago)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **423** Type: **not specified**

Top Production Measurements with the D0 Detector

Tuesday 28 July 2009 14:35 (20 minutes)

We present recent results related to the measurement of top quark production using ppbar collisions recorded with the D0 Detector at the Tevatron. The results are: Measurement of the top production cross section (abstract 216), search for W' decaying to top and b (226), forward-backward asymmetries in top quark pair production (227), Search for tt' resonances (231) and search for charged Higgs bosons (225).

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: AROV, Mikhail (Louisiana TU, Coll. Eng. & Science-Unknown-Unknown)

Session Classification: Top Quark Physics II

Track Classification: Top Quark Physics

Contribution ID: **424** Type: **not specified**

Top Properties Measurements with the D0 Detector

Monday 27 July 2009 17:30 (20 minutes)

We present recent results related to the measurement of top quark production using ppbar collisions recorded with the D0 Detector at the Tevatron. The results are: Measurement of the Wtb coupling and of the W boson helicity (abstract 220), search for anomalous top quark couplings (228) and top spin correlations (not submitted as separate abstract)

Authors: JUSTE, Aurelio (Fermilab); WAHL, Horst (Florida State University); SOLDNER-REMBOLD, Stefan (University of Manchester)

Presenter: JABEEN, Shabnam (Boston University-Unknown-Unknown)

Session Classification: Top Quark Physics I

Track Classification: Top Quark Physics

Contribution ID: **426** Type: **not specified**

Prospects for first ttbar cross section measurements at CMS

Tuesday 28 July 2009 15:35 (25 minutes)

Presenter: Dr KUMAR, Ashish (SUNY/Buffalo)

Session Classification: Top Quark Physics II

Contribution ID: **427** Type: **not specified**

Search for KL -> pi0 pi0 μ+μ− with KTeV data

Thursday 30 July 2009 16:30 (20 minutes)

This presentation will report on the first experimental search for KL -> pi0 pi0 μ+μ− based on data collected by the KTeV Experiment at the Fermi National Accelerator Laboratory in Batavia, Illinois. Although this decay mode is possible within the Standard Model the rate is suppressed by the very limited phase space. The HyperCP Experiment has recently observed three Sigma+ -> p+μ+μ− events within a narrow di-muon mass range of 213.8 MeV/c2 to 214.8 MeV/c2. This suggests that the process may occur via a neutral intermediary particle Beyond the Standard Model (BSM), Sigma+ -> p+ X0,(X0->μ+μ−) with a X0 mass of 214.3 MeV/c2±0.5 MeV/c2. Many BSM models such as Next-to-Minimal Supersymmetric (NMSSM) predict that the decay mode KL->pi0pi0μ+μ− can also occur via the aforementioned neutral boson: KL->pi0pi0X0,(X0->μ+μ−) thereby enhancing the rate well above the suppressed Standard Model prediction. The result of the KL -> pi0 pi0 μ+μ− search will be presented and the impact on the HyperCP evidence of BSM physics will be discussed.

Author: BELLANTONI, Leo (Fermilab)

Presenter: BELLANTONI, Leo (Fermilab)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **428** Type: **not specified**

Two particle correlations and viscosity in relativistic heavy ion collisions

Tuesday 28 July 2009 17:20 (25 minutes)

The event anisotropy measurements at RHIC suggest the matter created in heavy-ion collision flows with very little viscosity. Precise determination of "shear viscosity-to-entropy density" ratio is currently a subject of extensive study[1]. We present measurements of differential transverse momentum correlation functions from the STAR experiment in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. We analyze the data based on two differential correlation functions, namely $inclusive$ and a differential version of the correlation measure $\tilde{C}$ introduced by Gavin[1,2]. The correlation function of the particles are measured as a function of pseudo-rapidity and azimuthal angle in the range $0.2 < p_T < 2.0$ GeV/c at mid rapidity ($|\eta| < 1.0$) for various collision centralities. We report estimates of the viscosity based on the argument that the evolution of the width of the correlation functions is dominated by viscous broadening.

References

[1] S. Gavin and M. Abdel-Aziz, Phys. Rev. Lett. 97 (2006) 162302.

[2] M. Sharma and C.A. Pruneau, Phys. Rev. C 79 (2009) 024905.

Author: Dr SHARMA FOR THE STAR COLLABORATION, Monika (Wayne State University)

Presenter: Dr SHARMA FOR THE STAR COLLABORATION, Monika (Wayne State University)

Session Classification: Heavy Ions I

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **429** Type: **not specified**

W and Z boson production at hadron colliders

Tuesday 28 July 2009 14:50 (30 minutes)

I will review experimental issues related to W and Z boson production at hadron colliders, with particular emphasis on the measurement of the W boson mass. Recent measurements of W and Z production from the Tevatron will be discussed, as well as topics covered at the recent Milan workshop on the W mass measurement.

Author: HAYS, Christopher Paul (University of Oxford)

Presenter: HAYS, Christopher Paul (University of Oxford)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **430** Type: **not specified**

Welcome to DPF-2009

Monday 27 July 2009 08:30 (10 minutes)

Author: NOREN, Jay (Wayne State University)

Presenter: NOREN, Jay (Wayne State University)

Session Classification: Plenary I

Contribution ID: **431** Type: **not specified**

LHC Machine Status

Monday 27 July 2009 08:40 (30 minutes)

Author: Dr EVANS, Lyn (CERN)

Presenter: Dr EVANS, Lyn (CERN)

Session Classification: Plenary I

Contribution ID: **432** Type: **not specified**

Experimental Review of the Hadron Spectroscopy Session

Thursday 30 July 2009 16:30 (35 minutes)

Experimental Review of the Hadron Spectroscopy Session

Author: Dr PAPADIMITRIOU, Vaia (Fermilab)

Presenter: Dr PAPADIMITRIOU, Vaia (Fermilab)

Session Classification: Hadron Spectroscopy II

Track Classification: Hadron Spectroscopy

Contribution ID: **433** Type: **not specified**

Physics prospects for Belle upgrade

Thursday 30 July 2009 15:00 (30 minutes)

The Belle detector at the KEKB electron-positron collider has collected nearly 1˜ab^{-1} of data in its decade of operation. The KEKB group has proposed Super-KEKB, an upgrade of KEKB to increase the luminosity by two orders of magnitude during a three-year shutdown, with an ultimate goal of 8 x 10ˆ35/cmˆ2/s luminosity. To exploit the improved luminosity, an upgrade of the Belle detector has been proposed. A new international collaboration Belle-II, is being formed. Super-KEKB and Belle-II were officially placed on the KEK 5-year Roadmap in early 2008.

Author: Prof. KINOSHITA, Kay (University of Cincinnati)

Presenter: Prof. KINOSHITA, Kay (University of Cincinnati)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **434** Type: **not specified**

Theory review of the Hadron Spectroscopy session

Thursday 30 July 2009 17:05 (35 minutes)

Theory review of the Hadron Spectroscopy session

Author: SWANSON, Eric (University of Pittsburg)

Presenter: SWANSON, Eric (University of Pittsburg)

Session Classification: Hadron Spectroscopy II

Track Classification: Hadron Spectroscopy

Contribution ID: **435** Type: **not specified**

Diboson physics at Tevatron

Thursday 30 July 2009 15:20 (30 minutes)

We present the latest results on the production of WW, WZ, W gamma, Z gamma and ZZ events at the Fermilab Tevatron Collider. The results are based on the analyses of a few fbˆ-1 of data collected in p pbar collisions at center of mass energy of 1.96TeV by CDF and DO experiments during the Tevatron RunII. Analyses of the diboson production processes provide crucial test of the Standard Model, directly probing its predictions on the Trilinear Gauge Couplings.

Author: IASHVILI, Ia (SUNY at Buffalo)

Presenter: IASHVILI, Ia (SUNY at Buffalo)

Session Classification: Electroweak Physics II

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **436** Type: **not specified**

Diboson Production in Semileptonic Decay Modes

Tuesday 28 July 2009 15:25 (20 minutes)

WZ and ZZ Observation in lnujj and nunujj final states

Author: TBA

Presenter: Ms HURWITZ, Martina (University of Chicago)

Session Classification: Higgs Physics II

Contribution ID: **437** Type: **not specified**

Calibration of the ATLAS EM Calorimeter using W, Z, and J/psi to ee events

Tuesday 28 July 2009 15:40 (25 minutes)

For particle and jet energies above a few GeV, calorimeters provide the most precise measurements. Thus, calibration of the calorimeters is crucial to achieve those physics goals that are dependent on the energy resolution and scale. For the ATLAS EM calorimeter, the strategy is to obtain a global constant term that is less than 0.7\%. Information from test beams and the hardware calibration should ensure a local term that is less than 0.5\% over regions of size $\Delta\eta \times \Delta\phi = 0.2 \times 0.4$. Several physics channels are used to intercalibrate the 384 regions of size $\Delta\eta \times \Delta\phi = 0.2 \times 0.4$ to within 0.5\% in order to achieve the desired global constant term. During early data taking, electrons from W bosons will be used to develop a relative calibration in ϕ since there will be a factor of 10 more in statistics as compared to the number of Z bosons. The measurements from W and Z will be combined to improve the constant term. To fix the scale in the low energy domain, electrons from J/ψ decays will be used. A framework has been developed to use electrons from Z, W and J/psi to ee events to intercalibrate the EM calorimeter. In this talk details of the framework, different methods used for intercalibration using the above three physics channels, the performance of the framework, and some systematics uncertainties will be reported.

Author: COCHRAN JR, James Herbert (Iowa State University-Unknown-Unknown)

Co-author: AHMAD, Ashfaq (Stony Brook University)

Presenter: AHMAD, Ashfaq (Stony Brook University)

Session Classification: First Results from LHC

Track Classification: First Results from LHC

Contribution ID: **438** Type: **not specified**

Search for a Heavy Top Partner at the LHC

Tuesday 28 July 2009 18:10 (20 minutes)

Presented is a study of searches for two exotic particles - a heavy top quark partner with a fractional charge of 5/3, T(5/3), and its partner, the heavy B quark with charge -1/3. These particles decay to a top quark and a W boson, leading to very busy events with multi-leptons and multi-jets. Processes where same-sign dileptons are produced are considered. The backgrounds are predominantly from top pair production, QCD multi-jets, Z+jets, tt WW, tt W and multiple-W+jets production. The study shows that it is possible to observe these exotic particles during the early running period of the Large Hadron Collider.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: AVETISYAN, Aram (Brown)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **439** Type: **not specified**

Search for Extra Dimensions in the Diphoton Channel

Thursday 30 July 2009 15:40 (20 minutes)

We present a search for extra dimensions in the diphoton channel using the CMS detector at the Large Hadron Collider. The search is focused on the forthcoming 2009–2010 run at 10 TeV center-of-mass energy and ~ 100
$pbinv$ of data. We discuss event selection and optimization, as well as data-driven methods of estimating various backgrounds and efficiencies. The dominant source of background after all the selection requirements is SM diphoton production. We quote the sensitivity of the search both in terms of limits on the parameters of large and warped extra dimensions in the case of no excess observed, and in terms of signal discovery significance, if an excess is seen in data.

Author: KLIMA, Boaz (Fermi National Accelerator Lab. (Fermilab)-Unknown-Unknown)

Presenter: ESEN, Selda (Department of Physics-Brown University-Unknown)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **440** Type: **not specified**

Minimal Flavor Violation and Neutrinoless Double Beta Decay

Friday 31 July 2009 16:10 (25 minutes)

In many models of physics beyond the Standard Model, it is necessary to suppress new, large sources of flavor-changing neutral currents. One recipe is to demand that the new physics exhibits "minimal flavor violation."Though this is really a constraint on the quark sector of the theory, it can have strong effects on possible sources of lepton number violation. In particular, it strongly constrains operators that lead to neutrinoless double beta decay, and the interpretations of any positive signal among the next generation of searches.

Author: Dr KOLDA, Christopher (U of Notre Dame)

Presenter: Dr KOLDA, Christopher (U of Notre Dame)

Session Classification: Low Energy Searches for New Physics II

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **441** Type: **not specified**

Probing light hidden sectors via the U(1) portal

Thursday 30 July 2009 14:00 (25 minutes)

Abstract: I will discuss some of the motivations for considering new physics in a hidden sector, which interacts with the Standard Model via light GeV-scale mediators. For example, this sector may naturally contain a dark matter candidate. The focus will be on experimental probes of the light mediators, primarily through the vector portal - where a secluded U(1) sector kinetically mixes with the photon - using fixed target neutrino experiments, B-factories and rare kaon decays.

Author: Dr RITZ, Adam (U of Victoria)

Presenter: Dr RITZ, Adam (U of Victoria)

Session Classification: Low Energy Searches for New Physics I

Track Classification: Low Energy Searches for BSM Physics

Contribution ID: **442** Type: **not specified**

BSM searches at the LHC with Leptons and Jets

Tuesday 28 July 2009 16:30 (40 minutes)

The unprecedented energy of the Large Hadron Collider (LHC) will allow us to probe
the TeV energy scale for the first time and elucidate the nature of electroweak symmetry breaking.
New heavy particles may be produced leading to dramatic signatures in the LHC detectors.
The increase in energy from previous experiments will allow us to probe a previously unreachable regime. I will review the prospects for BSM physics at the LHC with final states involving high energy
leptons and jets.

Author: BLACK, Kevin (Harvard University)

Presenter: BLACK, Kevin (Harvard University)

Session Classification: Beyond the Standard Model II

Track Classification: Beyond the Standard Model

Contribution ID: **444** Type: **not specified**

Exotic Searches With Complex Final States

Friday 31 July 2009 16:30 (40 minutes)

A review of the discovery potential of the LHC for exotic phenomena involving complex final states is presented. Topics covered include searches for high mass di-boson resonances, fourth generation quarks, technicolor, black-holes etc. Challenges presented by unconventional final states involving long-lived particles predicted by hidden valley and other models are also discussed. The strategies being followed by the ATLAS and CMS experiments are described and prospects for discoveries using early data are presented.

Author: Prof. BOSE, Tulika (Boston University)

Presenter: Prof. BOSE, Tulika (Boston University)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **445** Type: **not specified**

Measurement of the Z boson transverse momentum spectrum on ATLAS with early data

Tuesday 28 July 2009 15:40 (20 minutes)

One of the benchmark analyses to be performed with the first data at the CERN Large Hadron Collider will be the measurement of the Z boson transverse momentum spectrum. I will present a prospective analysis for this measurement in the dimuon channel on the ATLAS experiment. The analysis uses simulated datasets at a center-of-mass energy of 10 TeV. After summarizing the motivations for the measurement, I will discuss the Z boson selection criteria, possible physics backgrounds, and background removal techniques with a focus on data-driven background determination. I will briefly talk about some of the systematics involved, and conclude with an outlook toward the collision data expected later this year.

Author: Mr KASHIF, Lashkar (Harvard University)

Presenter: Mr KASHIF, Lashkar (Harvard University)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **446** Type: **not specified**

Measurement of the W and Z + jets cross section with ATLAS

Tuesday 28 July 2009 16:50 (20 minutes)

The study of W or Z boson with accompanying hadronic jets in final states is of high importance at hadron colliders both to understand Standard Model processes and to measure background to Beyond Standard Model physics searches. The presence of one or more jets in the final state increases the complexity for the reconstruction of leptons and of missing transverse energy. The ATLAS prospects for the cross section measurement of W/Z+jets events at 14 TeV center of mass energy and integrated luminosity of 1 {\rm fb}^{-1} are presented. The statistical and systematic limitations are discussed in terms of probing perturbative QCD predictions and Monte Carlo generators.

Author: COCHRAN JR, James Herbert (Iowa State University)

Co-author: AHMAD, Ashfaq (Stony Brook University)

Presenter: AHMAD, Ashfaq (Stony Brook University)

Session Classification: Electroweak Physics I

Track Classification: Electroweak Physics [W/Z]

Contribution ID: **447** Type: **not specified**

Searches for BSM signatures at the Tevatron

Monday 27 July 2009 14:00 (40 minutes)

Large datasets from the D0 and CDF experiments at the Fermilab Tevatron have been used to search for evidence of beyond-SM physics. Direct searches for new particles and interactions resulting from specific models such as SUSY and Large Extra Dimensions will be discussed, as well as "model independent" searches.

Author: HAAS, Andrew (SLAC)

Presenter: HAAS, Andrew (SLAC)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **449** Type: **not specified**

Assortment of Di-Lepton Signatures and Physics Beyond the Standard Model

Thursday 30 July 2009 14:00 (40 minutes)

Dileptons are among the cleanest probes of new physics waiting to be discovered at the LHC. In this review, I discuss an assortment of signatures involving dileptons and the exciting new physics they may help uncover. High invariant mass dileptons with opposite sign may reveal a new resonance, a possible remnant of some unified gauge theory. On the other hand, same-sign dileptons alongside color production are expected when supersymmetric particles such as squarks and gluinos are produced. Finally, I discuss some recent exotic signatures associated with multiple, collimated di-lepton, the so called "Lepton-Jets". The high cross-section and relatively low Standard Model background allow for an early discovery and exploration in both CMS and ATLAS, using the excellent lepton ID of the two machines.

Author: HALYO, Valerie (Princeton University)

Presenter: HALYO, Valerie (Princeton University)

Session Classification: Beyond the Standard Model III

Track Classification: Beyond the Standard Model

Contribution ID: **450** Type: **not specified**

Overview of QuarkNet

Tuesday 28 July 2009 14:40 (20 minutes)

QuarkNet is national program of Education and Outreach in Particle Physics and now in its 12th year. The program consists of 52 Centers distributed across 25 States and Puerto Rico. Annually participating are 450 high school teachers, 100 high school students, and 100 particle physicist mentors across a dozen experiments. An overview of project status and program activities will be presented.

Author: Dr WAYNE, Mitchell (University of Notre Dame)

Presenter: Dr WAYNE, Mitchell (University of Notre Dame)

Session Classification: Education and Outreach in HEP

Track Classification: Education and Outreach in HEP

Contribution ID: **451** Type: **not specified**

Recent developments in the phenomenology of supersymmetric models

Monday 27 July 2009 16:30 (40 minutes)

I will review some of the recent developments in phenomenological aspects of supersymmetric model building. The discussion will
be organized around issues and models that are motivated by the supersymmetric little hierarchy problem and by constraints
on and searches for dark matter.

Author: Prof. MARTIN, Stephen (Northern Illinois University)

Presenter: Prof. MARTIN, Stephen (Northern Illinois University)

Session Classification: Beyond the Standard Model I

Track Classification: Beyond the Standard Model

Contribution ID: **452** Type: **not specified**

Measurement of D0-D0bar mixing and search for CP violation at Babar

Tuesday 28 July 2009 17:42 (24 minutes)

We present evidence of D^0-$\bar{D}^0$ mixing using a time-dependent amplitude analysis of the decay $D^0 \to K^+\pi^-\pi^0$ in a data sample of 384 fb^{-1} collected with the *BaBar* detector at the PEP-II e^+e^- collider at SLAC. Assuming CP conservation, we measure the mixing parameters $x'_{K\pi\pi^0}$ =[$2.61^{+0.57}_{-0.68}$\,(stat.)$\pm$0.39\,(sy $y'_{K\pi\pi^0} = [-0.06^{+0.55}_{-0.64}$\,(stat.) $\pm$0.34\,(syst.)]\%. The confidence level for the data to be consistent with the no-mixing hypothesis is
0.1%, including systematic uncertainties. This result is inconsistent with the no-mixing hypothesis with a significance of
3.2 standard deviations. We find no evidence of CP violation in mixing.

Authors: Prof. SOKOLOFF, Michael (University of Cincinnati); LONG, Owen (Babar Collaboration)

Presenter: Prof. SOKOLOFF, Michael (University of Cincinnati)

Session Classification: Joint Session Heavy Flavor Physics II/CP-Violation II

Track Classification: CP-violation

Contribution ID: **453** Type: **not specified**

Measurements of alpha in Babar

Thursday 30 July 2009 15:30 (30 minutes)

Measurements of alpha in Babar

Author: LONG, Owen (Babar Collaboration)

Presenter: Dr STRACKA, Simone (Babar Collaboration)

Session Classification: CP-violation III

Track Classification: CP-violation

Contribution ID: **455** Type: **not specified**

Modification of high p_{T} hadro-chemistry in Au+Au collisions relative to p+p

Friday 31 July 2009 17:30 (30 minutes)

We present high p_{T} pion, proton, kaon, and rho spectra measured with the STAR experiment in p+p and Au+Au collisions at 200 GeV. We find the kaon/pion ratio to be enhanced in Au+Au 200 GeV collisions relative to p+p 200 GeV collisions at p_T 6 GeV/c. The enhancement persists until p_{T} ˜ 11 GeV/c for central Au+Au 200 GeV collisions. We also show R_{AA} measured at the same center of mass of energy, and find kaon and proton R_{AA} to be higher than pion R_{AA} at pT > 6 GeV/c. Implications for medium induced modifications of jet chemistry will be discussed.

Author: Dr TIMMINS, Anthony (Wayne State University)

Presenter: Dr TIMMINS, Anthony (Wayne State University)

Session Classification: Heavy Ions III

Track Classification: Heavy Ion Physics/Hot and Dense QCD

Contribution ID: **456** Type: **not specified**

Discovery Potential of SM Higgs through H->WW Decay Modes at LHC with ATLAS Detector

Thursday 30 July 2009 14:35 (20 minutes)

We report results of a study of the SM Higgs discovery potential through the W-pair leptonic decay modes at the LHC with ATLAS detector. We used MC samples with full detector simulation and reconstruction of the ATLAS experiment to estimate the ATLAS detection sensitivity for the reaction of pp->H->WW->ll nu nu. We first conducted a cut-based analysis, and then performed multivariate analysis based on an advanced pattern recognition algorithm - Boosted Decision Trees (BDT). By applying the BDT technique in analysis the signal-to-background ratio in event selection and the Higgs detection significance can be improved significantly by a factor of about 2 depending on Higgs mass compared to that using cut-based analysis. For early LHC run at 10 TeV center of mass energy, we also estimate the detection sensitivity for SM Higgs through the W-pair leptonic decay modes with about 200/pb integrated luminosity data.

Presenter: Dr YANG, Haijun (University of Michigan)

Session Classification: Higgs Physics III

Contribution ID: **457** Type: **not specified**

Review of charm mixing and rare decays

Thursday 30 July 2009 14:00 (20 minutes)

Author: Prof. PETROV, Alexey (Wayne State University)

Presenter: Prof. PETROV, Alexey (Wayne State University)

Session Classification: Heavy Flavor Physics III

Track Classification: Heavy Flavor Physics [bottom, charm, tau]

Contribution ID: **458** Type: **not specified**

Physics Beyond the Standard Model at the Threshold

Friday 31 July 2009 14:00 (40 minutes)

The large hadron collider will begin physics operation late this year, and will provide a decisive test of more than 30 years of building models for physics beyond the standard model. This talk will critically review the case for physics beyond the standard model arising from present-day data, and ways of distinguishing them at the LHC. Emphasis will be placed on strong electroweak symmetry breaking and models in which the Higgs is a pseudo-Nambu-Goldstone boson.

Author: Prof. LUTY, Markus (UC Davis)

Presenters: Prof. LUTY, Markus (UC Davis); LUTY, Markus (University of California Davis)

Session Classification: Beyond the Standard Model IV

Track Classification: Beyond the Standard Model

Contribution ID: **459** Type: **not specified**

ATLAS Detector Status

Monday 27 July 2009 09:10 (20 minutes)

Author: SHANK, Jim (Boston University)

Presenter: SHANK, Jim (Boston University)

Session Classification: Plenary I

Contribution ID: **460** Type: **not specified**

CMS Detector Status

Monday 27 July 2009 09:30 (20 minutes)

Author: RAKNESS, Gregory (UCLA)

Presenter: RAKNESS, Gregory (UCLA)

Session Classification: Plenary I

Contribution ID: **461** Type: **not specified**

LHC-b Detector Status

Monday 27 July 2009 10:10 (20 minutes)

Author: JANS, Eddy (NIKHEF)

Presenter: JANS, Eddy (NIKHEF)

Session Classification: Plenary I

Contribution ID: **462** Type: **not specified**

ALICE Detector Status

Monday 27 July 2009 10:30 (30 minutes)

Author: HARRIS, John (Yale)

Presenter: HARRIS, John (Yale)

Session Classification: Plenary I

Contribution ID: **463** Type: **not specified**

Experimenal Searches for Dark Matter

Monday 27 July 2009 11:00 (30 minutes)

Author: GOLWALA, Sunil (Caltech)

Presenter: GOLWALA, Sunil (Caltech)

Session Classification: Plenary I

Contribution ID: **464** Type: **not specified**

Interpretation of Possible Signals of Dark Matter

Monday 27 July 2009 11:30 (30 minutes)

Author: PIERCE, Aaron (Michigan)

Presenter: PIERCE, Aaron (Michigan)

Session Classification: Plenary I

Contribution ID: **465** Type: **not specified**

Viscous Hydrodynamics in (3+1)Dimensions for Heavy Ion Collisions

Tuesday 28 July 2009 17:45 (25 minutes)

Author: VREDEVOOGD, Josh (MSU)

Presenter: VREDEVOOGD, Josh (MSU)

Session Classification: Heavy Ions I

Contribution ID: **466** Type: **not specified**

Education and Public Outreach of the Pierre Auger Observatory

Tuesday 28 July 2009 15:00 (20 minutes)

The scale and scope of the physics studied at the Auger Observatory offer significant opportunities for original outreach work. Education, outreach and public relations of the Auger collaboration are coordinated in a separate task whose goals are to encourage and support a wide range of education and outreach efforts that link schools and the public with the Auger scientists and the science of cosmic rays, particle physics, and associated technologies. The presentation will focus on the impact of the collaboration in Mendoza Province, Argentina, as: the Auger Visitor Center in Malargüe that has hosted over 40,000 visitors since 2001, a collaboration-sponsored science fair held on the Observatory campus in November 2007, the Observatory Inauguration in November 2008, public lectures, school visits, and courses for science teachers. A Google-Earth model of the Observatory and animations of extensive air showers have been created for wide public release. As the collaboration prepares its northern hemisphere site proposal, plans for an enhanced outreach program are being developed in parallel and will be described.

Presenter: Prof. SNOW, Greg (University of Nebraska)

Session Classification: Education and Outreach in HEP

Contribution ID: **467** Type: **not specified**

So you want to write for the public: An author's perspective

Tuesday 28 July 2009 16:00 (20 minutes)

Writing for a popular audience requires a very different approach than for our scientific colleagues. In this talk, an author of two popular HEP books, one popular magazine article and a recurring article in Fermilab Today shares some advice and experience.

Author: Dr LINCOLN, Don (Fermilab)

Presenter: Dr LINCOLN, Don (Fermilab)

Session Classification: Education and Outreach in HEP

Track Classification: Education and Outreach in HEP

Contribution ID: **468** Type: **not specified**

Particle Astrophysics, High Energy Gamma-ray and Neutrino Astronomy

Tuesday 28 July 2009 09:00 (30 minutes)

Author: OLINTO, Angela (University of Chicago)

Presenter: OLINTO, Angela (University of Chicago)

Session Classification: Plenary II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **469** Type: **not specified**

Early Universe and Cosmology

Tuesday 28 July 2009 09:30 (30 minutes)

Author: FRIEMAN, Josh (FNAL)

Presenter: FRIEMAN, Josh (FNAL)

Session Classification: Plenary II

Track Classification: Particle Astrophysics and Cosmology

Contribution ID: **470** Type: **not specified**

Higgs Searches

Tuesday 28 July 2009 10:00 (30 minutes)

Author: MARK, Kruse (Duke University)

Presenter: MARK, Kruse (Duke University)

Session Classification: Plenary II

Contribution ID: **471** Type: **not specified**

Electroweak Physics

Tuesday 28 July 2009 11:00 (30 minutes)

Author: SCHELLMAN, Heidi (Northwestern University)

Presenter: SCHELLMAN, Heidi (Northwestern University)

Session Classification: Plenary II

Contribution ID: **472** Type: **not specified**

Beyond SM Searchers

Tuesday 28 July 2009 11:30 (30 minutes)

Author: BELLANTONI, Leo (FNAL)

Presenter: BELLANTONI, Leo (FNAL)

Session Classification: Plenary II

Contribution ID: **473** Type: **not specified**

Beyond SM Theory

Tuesday 28 July 2009 12:00 (30 minutes)

Author: WANG, Liantao (Princeton)

Presenter: WANG, Liantao (Princeton)

Session Classification: Plenary II

Contribution ID: **474** Type: **not specified**

Mitsuyoshi Tanaka Dissertation Award

Wednesday 29 July 2009 08:45 (15 minutes)

Author: PATTERSON, Ryan (Caltech)

Presenter: PATTERSON, Ryan (Caltech)

Session Classification: Plenary III

Contribution ID: **475** Type: **not specified**

Low Energy Searches for BSM Physics

Wednesday 29 July 2009 09:00 (30 minutes)

Author: ROBERTS, Lee (Boston University)

Presenter: ROBERTS, Lee (Boston University)

Session Classification: Plenary III

Contribution ID: **476** Type: **not specified**

CP-violation

Wednesday 29 July 2009 09:30 (30 minutes)

Author: BROWDER, Tom (University of Hawaii)

Presenter: BROWDER, Tom (University of Hawaii)

Session Classification: Plenary III

Contribution ID: **477** Type: **not specified**

Heavy Flavor Physics (Experiment)

Wednesday 29 July 2009 10:00 (30 minutes)

Author: HITLIN, David (Caltech)

Presenter: HITLIN, David (Caltech)

Session Classification: Plenary III

Contribution ID: **478** Type: **not specified**

Heavy Flavor Physics (Theory)

Wednesday 29 July 2009 11:00 (30 minutes)

Author: GRINSTEIN, Benjamin (UC San Diego)

Presenter: GRINSTEIN, Benjamin (UC San Diego)

Session Classification: Plenary III

Contribution ID: **479** Type: **not specified**

Lattice QCD

Wednesday 29 July 2009 11:30 (30 minutes)

Author: EL-KHADRA, Aida (University of Illinois (Urbana))

Presenter: EL-KHADRA, Aida (University of Illinois (Urbana))

Session Classification: Plenary III

Contribution ID: **480** Type: **not specified**

Top Quark Physics

Wednesday 29 July 2009 12:00 (30 minutes)

Author: DATTA, Mousumi (FNAL)

Presenter: DATTA, Mousumi (FNAL)

Session Classification: Plenary III

Contribution ID: **481** Type: **not specified**

QCD Theory

Thursday 30 July 2009 09:00 (30 minutes)

Author: CAMPBELL, John (University of Glasgow)

Presenter: CAMPBELL, John (University of Glasgow)

Session Classification: Plenary IV

Contribution ID: **482** Type: **not specified**

QCD Experiment

Thursday 30 July 2009 09:30 (30 minutes)

Author: LINCOLN, Don (FNAL)

Presenter: LINCOLN, Don (FNAL)

Session Classification: Plenary IV

Contribution ID: **483** Type: **not specified**

Hadron Spectroscopy

Thursday 30 July 2009 10:00 (30 minutes)

Author: GODFREY, Stephen (Carleton University)

Presenter: GODFREY, Stephen (Carleton University)

Session Classification: Plenary IV

Contribution ID: **484** Type: **not specified**

Review of Heavy Ion Experiments

Thursday 30 July 2009 11:00 (30 minutes)

Author: DUNLOP, James (BNL)

Presenter: DUNLOP, James (BNL)

Session Classification: Plenary IV

Contribution ID: **485** Type: **not specified**

Theoretical Review of Heavy Ion Physics

Thursday 30 July 2009 11:30 (30 minutes)

Author: MCLERRAN, Larry (BNL)

Presenter: MCLERRAN, Larry (BNL)

Session Classification: Plenary IV

Contribution ID: **486** Type: **not specified**

Education and Outreach in HEP

Thursday 30 July 2009 12:00 (30 minutes)

Author: RUCHTI, Randal (University of Notre Dame)

Presenter: RUCHTI, Randal (University of Notre Dame)

Session Classification: Plenary IV

Contribution ID: **487** Type: **not specified**

Neutrino Physics (Experiment)

Friday 31 July 2009 09:00 (30 minutes)

Author: FLEMING, Bonnie (Yale University)

Presenter: FLEMING, Bonnie (Yale University)

Session Classification: Plenary V

Contribution ID: **488** Type: **not specified**

Neutrino Physics (Theory)

Friday 31 July 2009 09:30 (30 minutes)

Author: MA, Ernst (UC Riverside)

Presenter: MA, Ernst (UC Riverside)

Session Classification: Plenary V

Contribution ID: **489** Type: **not specified**

Recent Progress in Field and String Theory

Friday 31 July 2009 10:00 (30 minutes)

Author: HERZOG, Chris (Princeton University)

Presenter: HERZOG, Chris (Princeton University)

Session Classification: Plenary V

Contribution ID: **490** Type: **not specified**

Recent Progress in String Phenomenology

Friday 31 July 2009 11:00 (30 minutes)

Author: CVETIC, Mirjam (University of Pennsylvania)

Presenter: CVETIC, Mirjam (University of Pennsylvania)

Session Classification: Plenary V

Contribution ID: **491** Type: **not specified**

Latest Developments in Technologies for Detectors

Friday 31 July 2009 11:30 (30 minutes)

Author: BRAU, James (University of Oregon)

Presenter: BRAU, James (University of Oregon)

Session Classification: Plenary V

Contribution ID: **492** Type: **not specified**

Future Accelerators

Friday 31 July 2009 12:00 (30 minutes)

Author: ODDONE, Pier (FNAL)

Presenter: ODDONE, Pier (FNAL)

Session Classification: Plenary V

Contribution ID: **493** Type: **not specified**

Update on USCMS Education and Outreach

Tuesday 28 July 2009 15:20 (25 minutes)

Author: RUCHTI, Randal (University of Notre Dame)

Presenter: RUCHTI, Randal (University of Notre Dame)

Session Classification: Education and Outreach in HEP

Contribution ID: **494** Type: **not specified**

Update on USCMS Education and Outreach

Contribution ID: **495** Type: **not specified**

NuSOnG

Thursday 30 July 2009 16:30 (15 minutes)

Summary

Description of NuSOnG (Neutrino Scattering On Glass) physics potential, concentrating on neutrino electron scattering.

Author: Prof. DE GOUVEA, Andre (Northwestern)

Session Classification: Neutrino Physics III

Contribution ID: **496** Type: **not specified**

Minerva

Friday 31 July 2009 15:30 (25 minutes)

Summary

Status and Prospects of the Minerva Experiment.

Author: SCHELLMAN, Heidi

Session Classification: Neutrino Physics IV