

The Fifth Annual Large Hadron Collider Physics conference (LHCP2017)

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Shanghai Jiao Tong University



Book of Abstracts

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”Measurement of WW cross-section in pp collisions at 13TeV with the CMS detector

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A measurement of the $W+W^-$ cross section in pp collisions at 13 TeV is presented. The data were collected with the CMS detector at the LHC in 2015, and correspond to an integrated luminosity of $2.3 \pm 0.1 \text{ fb}^{-1}$. The measurement is performed by selecting events with one electron and one muon of opposite charge, accompanied by large missing transverse energy. The $W+W^-$ cross section is measured to be $115.3 \pm 5.8 \text{ (stat)} \pm 5.7 \text{ (exp)} \pm 6.4 \text{ (theo)} \pm 3.6 \text{ (lum)} \text{ pb}$, consistent with the standard model prediction.

Summary:

Posters / 256

J/ψ production in deeply inelastic scattering

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The color-singlet J/ψ production in deeply inelastic scattering at QCD next-to-leading order is studied for the first time. We find that it can provide useful reference to the J/ψ hadroproduction at QCD next-to-next-to-leading order. The color-octet J/ψ production at QCD leading order will also be addressed.

Summary:

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D^0 -meson production and elliptic flow measurements in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02 \text{ TeV}$ with ALICE

Xinye Peng¹

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Heavy quarks (charm and beauty) are produced on a short time scale compared to the formation time of the Quark-Gluon Plasma (QGP) which is formed in heavy-ion collisions at ultra-relativistic energy. They propagate through and interact with the medium. Thus, they are powerful probes to study the properties of the QGP. The measurements of the nuclear modification factor and azimuthal

anisotropy of D mesons allow us to investigate the parton energy loss mechanisms in the QGP and the transport properties of the medium.

In ALICE, D mesons are reconstructed in Pb-Pb collisions at central rapidity via their hadronic decay channels. The measurements of the D^0 nuclear modification factor and azimuthal anisotropy in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV in the centrality class 30-50% will be presented and compared to the theoretical predictions.

Summary:

Parallel Heavy Flavors / 210

(Rare) semileptonic B decays and LFU (theory talk)

Corresponding Author(s): altmanwg@ucmail.uc.edu

17' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

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A New US-CERN Summer Program on ATLAS Experiment of LHC at CERN for California State University System

Yongsheng Gao¹

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This abstract focuses on providing access to quality research opportunities for students from under represented groups through a summer research program through the Nuclear and Particle Physics Consortium at the California State University (CSU) system.

With over 460,000 students from a diverse range of backgrounds, the CSU system is the largest university system in the United states. It is also a minority serving institution. In 2013, the student body was 41% Latino (32% Mexican American) and 5% African American. At least 35% are the first person in their family to attend college. However, the campuses have limited research opportunities for students. We will discuss a program started by Professor Yongsheng Gao of CSU Fresno, and supported by the NSF International Research Experiences for Students and other CSU campuses, to provide CSU students with summer research experiences at CERN with mentors from a variety of institutions. Students are prepared for the program by taking an online courses on particle physics taught by Professor Gao, and doing several months of practical tutorials with CSU Fresno and other ATLAS institutions (Stanford, UC-Irvine, Washington, etc.) postdocs. Our talk will focus on the preparation and experiences of both the student and mentors.

Summary:

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A search and measurement of Standard Model Higgs boson decay to $\mu^+\mu^-$ at CEPC

Zhenwei Cui¹

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A Search and measurement at Circular Electron Positron Collider (CEPC) is reported for Higgs Boson rare decay to $\mu^+\mu^-$, of which the SM branch ratio is 2.19×10^{-4} . This is an important channel to further examine the Higgs couplings with second generation of fermions. The analysis is performed on 240GeV CEPC with expected 5ab-1 luminosity in 10 years, with GEANT4-based full simulation. The significance can reach 7.1 standard deviations (σ) in the model-independent analysis which uses only the information of Z boson decay, while can be 8.2 and 2.1σ in the exclusive $Z \rightarrow qq$ and $Z \rightarrow \nu\nu$ channels, respectively. Impact of the Magnetic Field Strength and Tracker size to these measurements are further investigated

Summary:

Plenary - Upgrade / 53

ALICE upgrade

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25' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Upgrade / 286

ALICE-Upgrade trackers based on monolithic active pixel sensors

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Summary:

Parallel Heavy Flavors / 200

ATLAS results on hadron spectroscopy, including exotic states

Corresponding Author(s): leonid.gladilin@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Upgrade / 51

ATLAS upgrade

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25' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Outreach / 343

After the Higgs: New challenges in CERN communications

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

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Angular analysis of $b \rightarrow s \ell \ell$ processes at CMS

Geng Chen¹

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The Flavour Changing Neutral Current decays of type $b \rightarrow s \mu^+ \mu^-$ provide high sensitivity to New Physics contributions. Sensitive observables include the branching fraction, muon forward-backward asymmetry, the fraction of longitudinal polarization, form-factor independent variables etc. CMS can detect and measure them very well. We report the recent results from CMS on these topics.

Summary:

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$B \rightarrow \pi \pi$ transition form factor in LCSR

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We study $B \rightarrow \pi \pi$ form factors using QCD light-cone sum rules with B -meson distribution amplitudes. These form factors describe the semileptonic decay $B \rightarrow \pi \pi \ell \bar{\nu}_\ell$, and constitute an essential input in $B \rightarrow \pi \pi \ell^+ \ell^-$ and $B \rightarrow \pi \pi \pi$ decays. We employ the correlation functions where a dipion isospin-one state is interpolated by the vector light-quark current. We obtain sum rules where convolutions of the P -wave $\bar{B}^0 \rightarrow \pi^+ \pi^0$ form factors with the time-like pion vector form factor are related to universal B -meson distribution amplitudes. These sum rules are valid in the kinematic

regime where the dipion state has a large energy and a low invariant mass, and reproduce analytically the known light-cone sum rules for $B \rightarrow \rho$ form factors in the limit of ρ -dominance with zero width, thus providing a systematics for so-far-unaccounted corrections to $B \rightarrow \rho$ transitions. Using data for the pion vector form factor, we estimate finite width-effects and the contribution of excited ρ -resonances to the $B \rightarrow \pi\pi$ form factors. We find that these contributions amount up to $\sim 20\%$ in the small dipion mass region where they can be effectively regarded as a nonresonant (P -wave) background to the $B \rightarrow \rho$ transition.

Summary:

Parallel Upgrade / 269

BSM Searches at LHC after upgrade

Corresponding Author(s): monika.wielers@cern.ch

Summary:

Parallel Upgrade / 291

BSM at future colliders

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Summary:

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$B_c \rightarrow BsJ$ form factors and B_c decays into BsJ in covariant light-front approach

Yu-ji Shi^{None} ; Wei Wang^{None} ; Zhen-Xing Zhao^{None}

We suggest to study the B_s and its excitations $B_{s,J}$ in the B_c decays. We calculate the $B_c \rightarrow B_{s,J}$ and $B_c \rightarrow B_J$ form factors within the covariant light-front quark model, where the $B_{s,J}$ and B_J denote an s-wave or p-wave $\bar{b}s$ and $\bar{b}d$ meson, respectively. The form factors at $q^2 = 0$ are directly computed while their q^2 -distributions are obtained by the extrapolation. The derived form factors are then used to study semileptonic $B_c \rightarrow (B_{s,J}, B_J)\bar{l}$ decays, and nonleptonic $B_c \rightarrow B_{s,J}$. Branching fractions and polarizations are predicted in the standard model. We find that the branching fractions are sizable and might be accessible at the LHC experiment and future high-energy e^+e^- colliders with a high luminosity at the Z -pole. The future experimental measurements are helpful to study the nonperturbative QCD dynamics in the presence of a heavy spectator and also of great value for the spectroscopy study.

Summary:

Parallel Heavy Flavors / 208

Belle II status and prospect on flavor physics

Corresponding Author(s): jing.ge.shiu@cern.ch, physjg@hep1.phys.ntu.edu.tw

18' Talk +5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 266

Belle II status and prospect on flavor physics

Jing-Ge Shiu¹

¹ *National Taiwan University (TW)*

Corresponding Author(s): jing.ge.shiu@cern.ch

The successful first beam circulation of the SuperKEKB accelerator at KEK in 2016 opens a new era of collider physics. The associated Belle II experiment will start commissioning in 2 years. Complementary to the LHC experiments, Belle II is designed to explore the intensity frontier. The target total integrated luminosity is 50ab^{-1} , which is 50 times larger than the Belle experiment. This offers high data statistics for precision measurements and probing new physics in rare decay studies. In this talk, I will present the current status of Belle II and highlight its prospect on flavor physics.

Summary:

Parallel Upgrade / 293

CEPC-SPPC

Corresponding Author(s): manqi.ruan@cern.ch

Summary:

Parallel Outreach / 345

CMS open data in research

Corresponding Author(s): achim.geiser@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Upgrade / 52

CMS upgrade

Corresponding Author(s): jian.wang@cern.ch

25' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Posters / 98

CMS-HF Calorimeter Upgrade for Run II

Erhan Gulmez¹

¹ *Bogazici University (TR)*

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CMS-HF Calorimeters have been undergoing a major upgrade for the last couple of years to alleviate the problems encountered during Run I, especially in the PMT and the readout systems. In this poster, the problems caused by the old PMTs installed in the detectors and their solutions will be explained. Initially, regular PMTs with windows thick enough to cause Cherenkov radiation were used. Instead of the light coming through the fibers from the detector, stray muons passing through the PMT itself produce Cherenkov radiation in the PMT window, resulting in erroneously large signals. Usually, large signals are the result of very high-energy particles in the calorimeter and are tagged as important. As a result, these so-called “window events” generate false triggers. Four-anode PMTs with thinner windows were selected to reduce these “window events.” Additional channels also help eliminate such remaining events through some algorithms comparing the output of different PMT channels. During the EYETS 16/17 period in the LHC operations, the final components of the modifications to the readout system, namely the two-channel front-end electronics cards, are installed. Complete upgrade of the HF Calorimeter, including the preparations for the Run II will be discussed in this poster, with possible effects on the eventual data taking.

Summary:

Plenary - Heavy Flavors / 42

CP Violation (B, D and baryon)

Corresponding Author(s): francesca.dordei@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Closing Plenary / 69

Closing remarks

Corresponding Author(s): mitselmakher@phys.ufl.edu, aleandro.nisati@cern.ch

Parallel QCD / 229

Collective effects and particle correlation in ATLAS

Corresponding Author(s): oldrich.kepka@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Ions / 325

Collectivity in proton-proton, proton-nucleus and nucleus-nucleus collisions

Corresponding Author(s): hirano@sophia.ac.jp

15' Talk and 5' Discussion

Parallel Outreach / 346

Communicating ATLAS: How the ATLAS experiment tailors its public communication

Corresponding Author(s): luis.flores.castillo@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 135

Composite Models

Corresponding Author(s): t.flacke@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 120

Compressed SUSY

Corresponding Author(s): satoshi.shirai@ipmu.jp

Summary:

Posters / 262

Constraining Z' widths from p_T measurements in Drell-Yan processes

Juri Fiaschi¹ ; Elena Accomando² ; Stefano Moretti³ ; Claire Shepherd-Themistocleous³

¹ *University of Southampton*

² *Southampton University*

³ STFC - Rutherford Appleton Lab. (GB)

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We define a Focus Point (FP) Asymmetry, A_{FP} , obtained by integrating the normalised transverse momentum distribution of either lepton produced in the Drell-Yan (DY) process below and above a point where a variety of popular Z' models all have the same magnitude.

For a given Z' mass the position of this FP is predictable, depending only on the collider energy and on the low transverse momentum cut chosen in the normalisation procedure.

The resulting A_{FP} is very sensitive to the Z' width, and can be used to constrain this parameter in experimental fits.

Summary:

Parallel Upgrade / 268

Constraining BSM at the HL-LHC

Corresponding Author(s): stefaniagori83@gmail.com, goris@uchicago.edu, s.gori@sns.it, sgori@ph.tum.de, stefaniagori706@gmail.com

Summary:

Opening Plenary / 59

Current and near future research activity at CERN

Corresponding Author(s): eckhard.elsen@cern.ch

Plenary - Searches / 40

DM searches

Corresponding Author(s): tae.min.hong@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 121

DM simplified models

Corresponding Author(s): myeonghun.park@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 97

Dark Photon Search at A Circular e^+e^- Collider

Min He¹ ; Xiao-Gang He^{None} ; Cheng-Kai Huang^{None}

¹ *INPAC, Department of Physics and Astronomy, Shanghai Jiao Tong University*

Corresponding Author(s): hemin.sjtu@gmail.com, hexg@phys.ntu.edu.tw

One of the interesting portals linking a dark sector and the standard model (SM) is the kinetic mixing between the SM $U(1)_Y$ field with a new dark photon A' from a $U(1)_{A'}$ gauge interaction. Stringent limits have been obtained for the kinetic mixing parameter ϵ through various processes. In this work, we study the possibility of searching for a dark photon interaction at a circular e^+e^- collider through the process $e^+e^- \rightarrow \gamma A'^* \rightarrow \gamma \mu^+ \mu^-$. We find that the constraint on ϵ^2 for dark photon mass in the few tens of GeV range, assuming that the $\mu^+ \mu^-$ invariant mass can be measured to an accuracy of $0.5\% m_{A'}$, can be better than 3×10^{-6} for the proposed CEPC with a ten-year running at 3σ (statistic) level, and better than 2×10^{-6} for FCC-ee with even just one-year running at $\sqrt{s} = 240$ GeV, better than the LHC and other facilities can do in a similar dark photon mass range. For FCC-ee, running at $\sqrt{s} = 160$ GeV, the constraint can be even better.

Summary:

Posters / 168

Dark matter search results from the PandaX-II experiment

Mengjiao Xiao¹

¹ *University of Maryland, College Park*

Corresponding Author(s): mengjiaoxiao@gmail.com

The PandaX (Particle AND Astrophysical Xenon) project is a staged xenon-based underground experiment at the China Jin-Ping Underground Laboratory. Using a dual phase xenon time projection chamber (TPC) technology, the second phase of the experiment, PandaX-II, contains more than half ton LXe in the sensitive volume for WIMP dark matter searches.

PandaX-II started the data taking in 2016 and this poster will present the recently released results while focus on the data analysis.

Summary:

Posters / 172

Data Scouting : A New Trigger Paradigm

Swagata Mukherjee¹

¹ *Rheinisch-Westfaelische Tech. Hoch. (DE)*

Corresponding Author(s): s.mukherjee@cern.ch

In 2011, the CMS collaboration introduced the concept of data scouting as an alternative strategy to normal data-taking technique, allowing to take data that otherwise would be rejected by the trigger filters. This special data flow, based on event-size reduction rather than event filtering, was exercised to maintain sensitivity to new light resonances decaying to jets, with very small online and offline

resources allocated to it. The challenges implied by this new workflow and the solutions developed within the CMS experiment are shown. This technique is now a standard ingredient for CMS data-taking strategy. In this poster, the present status of data scouting in CMS and the improvements introduced in 2015 and 2016 is presented.

Summary:

Parallel EWK / 247

Di- and multiboson measurements in ATLAS

Corresponding Author(s): elena.yatsenko@cern.ch

Parallel EWK / 248

Di- and multiboson measurements in CMS

Corresponding Author(s): kdlong@wisc.edu

Parallel Higgs / 318

Di-Higgs production at the LHC and beyond

Corresponding Author(s): jzurita@physik.uzh.ch

14' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Searches / 38

Diboson

Corresponding Author(s): ljiljana.morvaj@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 78

Discussion

Summary:

Parallel Higgs / 316

Discussion

Summary:

Parallel Higgs / 313

Discussion

Summary:

Parallel TOP / 77

Discussion

Summary:

Parallel Higgs / 324

Discussion

Summary:

Parallel Higgs / 321

Discussion

Summary:

Parallel Higgs / 309

Discussion

Summary:

Parallel Higgs / 304

Discussion

Summary:

Parallel TOP / 86

Discussion

Summary:

Parallel TOP / 92

Discussion

Summary:

Parallel EWK / 253

Discussion

Posters / 258

Double Parton Scattering of Electroweak Gauge Boson Productions at 13 TeV and 100 TeV Proton-Proton Colliders

Author(s): Ke-Pan Xie¹

Co-author(s): Bin Yan¹; Qing-Hong Cao¹; Yandong Liu¹

¹ Peking University

Corresponding Author(s): kpxie@pku.edu.cn

We study double parton scattering (DPS) processes in gauge boson plus two jets (W/Zjj) final state and same sign W bosons ($W^\pm W^\pm$) final state at pp-collider with $\sqrt{s} = 13$ TeV and 100 TeV. We compare two different double parton models. After that, we discuss the kinematic distribution features of DPS events, showing the existence of distinctive observables, which can be used to separate DPS from the single parton scattering backgrounds. The crucial physical quantity in DPS, σ_{eff} , is under detailed research in this work. The possibility of DPS being background of standard model processes is also studied.

Summary:

Plenary - Searches / 33

EW SUSY

Corresponding Author(s): till.eifert@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 241

EW precision tests from Drell Yan at LHC

Corresponding Author(s): riccardo.torre@cern.ch

A discussion on how high-energy Drell-Yan processes at LHC have the potential to improve some of the LEP electroweak precision tests, what is the validity of this approach, and future prospects.

Plenary - EWK / 28

EWK precision measurements

Corresponding Author(s): savin@mail.desy.de, alexander.savin@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 242

Electroweak precision measurements in ATLAS

Corresponding Author(s): olivier.arnaez@cern.ch

Summary:

Parallel EWK / 243

Electroweak precision measurements in CMS

Corresponding Author(s): milos.djordjevic@cern.ch

Summary:

Parallel Performance / 192

Event global properties for heavy ion data at ALICE experiment

Corresponding Author(s): hua.pei@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 194

Evolution of online algorithms in ATLAS and CMS in Run2

Corresponding Author(s): thiago.tomei@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Outreach / 348

Exhibiting the Alice experiment

Corresponding Author(s): despina.hatzifotiadou@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 100

Exotic Higgs Decays at the LHeC

Chen Zhang¹

¹ *Peking University*

Corresponding Author(s): larry@pku.edu.cn

I will discuss the prospects of searching for exotic Higgs decays at the proposed Large Hadron Electron Collider (LHeC), which is a high luminosity electron-proton collider expected to run synchronously with the HL-LHC. Two examples will be presented, namely the invisible Higgs decay and the Higgs decaying to 4b via intermediate scalars. Compared to the HL-LHC, the LHeC is demonstrated to yield at least comparable sensitivity in the invisible Higgs channel and much better sensitivity in the Higgs to 4b channel. These results are very attractive if there is no available lepton collider which can copiously produce the Higgs boson before the end of the HL-LHC.

Summary:

Parallel Searches / 127

Exotica searches at LHCb

Corresponding Author(s): martino.borsato@cern.ch

15' talk and 3' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Closing Plenary / 67

Experimental review

Corresponding Author(s): luca.malgeri@cern.ch

Parallel Upgrade / 292

FCC ee/hh and High Energy LHC

Corresponding Author(s): michelangelo.mangano@cern.ch

Summary:

Parallel TOP / 91

FCNC results in ATLAS and CMS

Corresponding Author(s): maksim.perfilov@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 254

Factorization and Resummation for Jet Processes

Dingyu Shao^{None}

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Jets not only display the behaviour of QCD over a wide range of energy scales, from hard colliding energy to the hadronization energy, but also contain important signatures of exotic physics, such as top quarks or particles beyond the SM. In particular, recently jet substructure observables are playing a central role in a large number of analyses at the LHC. Most of the theoretical discussion of these aspects has taken place in the context of MC simulation studies. However, MC analysis is not always good enough, and it is difficult to extract the key characteristics of individual substructure methods and reveal the relations between them. With this motivation, it is imperative to understand jet observables from the first principles QCD.

In our recent series papers we have constructed a new effective field theory which fully factorizes non-global jet observables for the first time. Our formalism provides the basis for higher-order logarithmic resummations of jet and other non-global observables. As a nontrivial consistency check, we used it to obtain explicit next-to-next-to-leading order results for all logarithmically enhanced terms in several different non global jet observables and verified those against numerical fixed order computations.

Summary:

Parallel Heavy Ions / 334

Fixed-target Heavy Ion Physics at LHCb

Corresponding Author(s): emilie.maurice@llr.in2p3.fr

15' Talk and 3' Discussion

Posters / 170

Flavor Changing Neutral Higgs Interactions with Top and Tau at Hadron Colliders

Chung Kao¹ ; George W.S. Hou² ; Masaya Kohda² ; Brent McCoy¹ ; Amarjit Soni³

¹ University of Oklahoma

² National Taiwan University

³ Brookhaven National Lab

Corresponding Author(s): kao@physics.ou.edu

A general two Higgs doublet model (2HDM) is adopted to study the signature of flavor changing neutral Higgs (FCNH) decay

$\phi^0 \rightarrow t\bar{c} + \bar{t}c$ and $\phi^0 \rightarrow \tau\mu$, where

ϕ^0 could be a CP-even scalar (H^0) or a CP-odd pseudoscalar (A^0)

as well as $t \rightarrow ch^0$.

Measurement of the light 125 GeV neutral Higgs boson (h^0) couplings at the Large Hadron Collider (LHC) favor the decoupling limit or the alignment limit of a 2HDM, in which gauge boson and diagonal fermion couplings of h^0 approach Standard Model values.

In such limit, FCNH couplings of h^0 are naturally suppressed by a small mixing parameter $\cos(\beta - \alpha)$, while the off-diagonal couplings of heavier neutral scalars ϕ^0 are sustained by $\sin(\beta - \alpha) \sim 1$.

We study physics background from dominant processes with realistic acceptance cuts and tagging efficiencies. Promising results are found for the LHC running at 13 or 14 TeV collision energies as well as future pp colliders at 28 TeV, 33 TeV, or 100 TeV.

Summary:

Parallel Upgrade / 271

Flavour physics reach after upgrade

Corresponding Author(s): olafs@physik.uzh.ch, olafs@physik.unizh.ch

Summary:

Plenary - Heavy Ions / 25

Forward heavy ion and fixed target physics

Corresponding Author(s): burkhard.schmidt@cern.ch, schmidt@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 279

General Mass Insertion Expansion in Flavour Physics

Janusz Rosiek¹

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Calculating amplitudes for the flavor changing transitions in terms of the off-diagonal elements of mass matrices (so called “mass insertions”) in the theory defined in “gauge basis” (before mass matrix diagonalization) is the common technique in analyzing the flavor structure of the New Physics models. I will present a general method allowing to expand any QFT amplitude calculated in the mass-eigenstates (physical) basis into series in mass insertions, to any required order. The presented method is purely algebraic, translating an amplitude written in the mass eigenbasis into mass insertions series without performing diagrammatic calculations in gauge basis. It can be applied for all types of mass matrices - either Hermitian (scalar or vector), general complex (Dirac fermions) or complex symmetric (Majorana fermions). In addition, proposed expansion has been automatized in the form of publicly available specialized Mathematica package, “MassToMI”, which I briefly describe. The package allows to obtain analytical expressions directly relating flavor observables to New Physics parameters without tedious and error-prone direct calculation of Feynman diagrams with mass insertions as additional vertices.

Summary:

I will present an algebraic technique allowing to expand any QFT amplitude calculated in the mass-eigenstates (physical) basis into series in mass insertions, to any required order, without performing diagrammatic calculations with mass insertions. The method works for any type of mass matrices, either for scalar, vector, Dirac or Majorana fermion fields. It has also been automatized in the form of specialized Mathematica package.

Posters / 179

Geometric Scaling Analysis of Deep Inelastic Scattering Data Including Heavy Quarks

qingdong wu¹ ; Yi Yang¹

¹ *Guizhou Normal University*

Corresponding Author(s): 1778667381@qq.com, yangyigz@yeah.net

An analytic massive total cross section of photon–proton scattering is derived, which has geometric scaling. A geometric scaling is used to perform a global analysis of the deep inelastic scattering data on inclusive structure function F_2 measured in lepton–hadron scattering experiments at small values of Bjorken x . It is shown that the descriptions of the inclusive structure function F_2 and longitudinal structure function F_L are improved with the massive analytic structure function, which may imply

the gluon saturation effect dominating the parton evolution process at HERA. The inclusion of the heavy quarks prevent the divergence of the lepton-hadron cross section, which plays a significant role in the description of the photoproduction region.

Summary:

Posters / 5

Hadroproduction and production on nuclear targets of phi-mesons in the Quark-Gluon String model

Carlos Merino¹ ; Gevorg H. Arakelyan² ; Yuli M. Shabelski³

¹ *Departamento de Fisica de Particulas, Facultade de Fisica and Instituto Galego de Fisica de Altas Enerxias (IGFAE), Universidade de Santiago de Compostela (Spain)*

² *A.Alikhanyan National Scientific Laboratory, Yerevan Physics Institute (Armenia)*

³ *Petersburg Nuclear Physics Institute, NCR Kurchatov Institute, Gatchina (Russia)*

Corresponding Author(s): carlos.merino@usc.es, argev@mail.yerphi.am, shabelsk@thd.pnpi.spb.ru

We use the Quark-Gluon String Model to obtain a quantitatively good description of the phi-meson production experimental data in hadron-nucleon collisions on the spectra of secondary phi, as well as on the ratios of phi/pi- and phi/K-production cross sections, for a wide energy region. We also consider the experimental data on phi-meson production on nuclear targets, and we find that they present unusually small shadow corrections for the inclusive density in the midrapidity region.

Summary:

Plenary - Heavy Ions / 23

Hard probes (W, Z, jets,...)

Corresponding Author(s): yen-jie.lee@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 222

Heavy Flavour production at LHCb

Corresponding Author(s): patrick.spradlin@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 202

Heavy flavour (exotics) spectroscopy (phenomenology)

Corresponding Author(s): xiangliu@lzu.edu.cn

20' Talk +4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 209

Heavy flavour on the lattice (spectroscopy, form factors)

Corresponding Author(s): sasa.prelovsek@ijs.si

17' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 199

Heavy flavour production and spectroscopy at CMS

Corresponding Author(s): sarmad.masood.shaheen@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Upgrade / 272

Heavy-ion physics reach in High-Luminosity Run3 and Run4 at LHC

Corresponding Author(s): cristina.terrevoli@cern.ch

Summary:

Posters / 173

Higgs Properties measurements using four lepton decay channel

Muhammad Bilal Kiani¹

¹ *Universita e INFN Torino (IT)*

Corresponding Author(s): muhammad.bilal.kiani@cern.ch

The properties of the Higgs boson would be presented in the $H \rightarrow ZZ \rightarrow 4\ell$ ($\ell = e, \mu$) decay channel using a data sample corresponding to an integrated luminosity of 36.8 fb^{-1} of proton-proton collisions at a center-of-mass energy of 13 TeV recorded by the CMS detector at the LHC. The expected significance for the standard model Higgs boson with $m_H = 125.09 \text{ GeV}$ is 8.0σ . The signal strength modifiers for the main Higgs boson production modes would also be constrained. The model independent differential fiducial cross sections as a function of the p_T of the Higgs boson, the number of associated jets, and the p_T of the leading associated jet would be determined. The mass and width of Higgs boson would also be reported.

Summary:

Plenary - Higgs / 13

Higgs Yukawa couplings

Corresponding Author(s): georges.aad@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 317

Higgs exotic decays in natural theories

Corresponding Author(s): chrisverhaaren@gmail.com

14' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Upgrade / 270

Higgs measurements at LHC after upgrade

Corresponding Author(s): miguel.vidal.marono@cern.ch

Summary:

Parallel Higgs / 308

Higgs measurements in WW, tautau and mumu channels with ATLAS

Corresponding Author(s): kathrin.becker@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 307

Higgs measurements in WW, tautau and mumu channels with CMS

Corresponding Author(s): arun.kumar@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 302

Higgs measurements in high resolution channels with ATLAS

Corresponding Author(s): eleni.mountricha@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 303

Higgs measurements in high resolution channels with CMS

Corresponding Author(s): junquan.tao@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 305

Higgs physics and effective field theories

Corresponding Author(s): david.marzocca@gmail.com, marzocca@physik.uzh.ch

14' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 310

Higgs production in association with single top

Corresponding Author(s): timluyu@yahoo.com.tw

14' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Higgs / 12

Higgs properties I - New results

Corresponding Author(s): jonatan.piedra.gomez@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - Higgs / 301

Higgs properties II - Higgs combinations

Corresponding Author(s): mingshui.chen@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Higgs / 312

Higgs results with direct top and b-Yukawas with ATLAS

Corresponding Author(s): zhijun.liang@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 311

Higgs results with direct top and b-Yukawas with CMS

Corresponding Author(s): christian.contreras-campana@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 263

Higgs singlet catalyzed first order phase transition and gravitational wave signals

Chao Wei^{None}

Corresponding Author(s): chaoweian@gmail.com

In this talk I mainly discuss the first order electroweak phase transition (EWPT) triggered by a Higgs singlet. Bubble nucleation as well as constraints from Higgs measurements at the LHC run-2 will be discussed. Stochastic gravitational wave signals in spaced-based interferometer generated by the first order EWPT at the will be shown in the talk.

Summary:

Plenary - Searches / 37

High mass searches

Corresponding Author(s): s.mukherjee@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel QCD / 226

Higher order QCD calculations

Corresponding Author(s): huaxingzhu@gmail.com

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Opening Plenary / 64

Highlights and perspectives from the ALICE experiment

Andrea Dainese¹

¹ *INFN - Padova (IT)*

Corresponding Author(s): andrea.dainese@pd.infn.it

Summary:

Opening Plenary / 62

Highlights and perspectives from the ATLAS experiment

Corresponding Author(s): ludovico.pontecorvo@cern.ch

Summary:

Opening Plenary / 61

Highlights and perspectives from the CMS experiment

Corresponding Author(s): butler@fnal.gov

Opening Plenary / 63

Highlights and perspectives from the LHCb experiment

Corresponding Author(s): guy.wilkinson@cern.ch

Parallel Searches / 128

Hunting (Pseudo-)Immortal Exotica in the Particle Desert

Corresponding Author(s): james.pinfold@cern.ch

15' talk and 3' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 244

Impact of EW, QED, mixed QCD/EW corrections in W mass

Corresponding Author(s): alessandro.vicini@mi.infn.it

The results of a comprehensive analysis of electroweak, QED and mixed QCD-electroweak corrections underlying the precise measurement of the W-boson mass at hadron colliders will be presented, and an up-to-date estimate of the main theoretical uncertainties of perturbative nature will be provided. These results can serve as a guideline for the assessment of the theoretical systematics at the Tevatron and LHC and allow a more robust precision measurement of the W-boson mass at hadron colliders.

Parallel Searches / 133

Interference in resonance searches

Corresponding Author(s): eleniv@nikhef.nl

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 261

Investigation of the fast timing capabilities of the Silicon sensors for the CMS high granularity calorimeter

Raman Khurana¹¹ National Central University (TW)

Corresponding Author(s): raman.khurana@cern.ch

The High Granularity Calorimeter (HGCal) is the technology choice of the CMS collaboration for the endcap calorimetry upgrade planned to cope with the harsh radiation and unprecedented in-time event pileup projected at the High Luminosity-LHC era. In this context, profiting from fast-timing information (~tens of picoseconds) embedded in the calorimeter would represent a unique capability for resolving information from individual collisions at the HL-LHC. This will enhance the reconstruction and physics capabilities of the CMS detector in terms of pileup mitigation and particle identification. The HGCal is realized as a 52-layer sampling calorimeter, including 600m² of silicon sensors and 500m² of scintillators read by SiPMs. We present the concept and expected use of the precision-timing in the HGCal, along with results from beam-tests of silicon sensors - both unirradiated and irradiated. We show that for signals in the silicon above a few tens of MIPs (minimum ionizing particles) the precision is of the order of 20ps.

Summary:

poster presentation on behalf of CMS.

Posters / 1

Jet Mass Dependent Fragmentation

Károly Urmossy¹¹ Shandong University

Corresponding Author(s): karoly.uermoessy@cern.ch

1. Microcanonical statistical jet-fragmentation model is presented
2. Arguments are enumerated supporting the usage of the Jet Mass as fragmentation scale
3. fits to ep and pp data are presented
4. DGLAP evolution is discussed
5. applications in pp and AA collisions (hadron spectra, v₂) are discussed

Summary:

We propose the characterization of fragmentation functions by the energy fraction \tilde{x} , a hadron takes away from the energy of the jet measured *in the frame co-moving with the jet*. Besides, we propose the usage of the *jet mass as the fragmentation scale* \tilde{Q} . We show that these two Lorentz-invariant variables emerge naturally in a microcanonical ensemble with conserved four-momentum. Then, we construct a statistical hadronization model, in which, two features of the hadronic final states in various high-energy reactions (power law spectra and negative-binomial multiplicity distributions) can be connected simply. Finally, we analyze the scale dependence of the parameters of the model (power of the spectrum and mean energy per hadron) in the ϕ^3 theory. Fitting fragmentation functions in diffractive positron-proton and proton-proton collisions, we obtain a prediction for the jet mass dependence of the hadron multiplicity distribution inside jets.

Refs.: arXiv:1606.03208, arXiv:1605.06876

Parallel Heavy Ions / 330

Jet and heavy flavor physics in the vacuum and the medium

Corresponding Author(s): matteo.cacciari@cern.ch

20' Talk and 4' Discussion

Parallel Performance / 190

Jet and missing ET reconstruction (including substructure) in ATLAS and CMS

Corresponding Author(s): teng.jian.khoo@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 220

Jet and photon measurements with ATLAS

Corresponding Author(s): benjamin.philip.nachman@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 223

Jet properties in ALICE

Corresponding Author(s): yaxian.mao@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 224

Jet substructure and algorithms

Corresponding Author(s): chul.kim@cern.ch, chul.joon.kim@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - QCD / 18

Jets and Photons

Corresponding Author(s): cristina.biino@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - Heavy Flavors / 44

LF Universality

Corresponding Author(s): francesco.polci@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 341

LHC phenomenology of DM coannihilations

Corresponding Author(s): mdt.maikel@gmail.com

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Special Plenary Session / 70

LHC: history

Corresponding Author(s): luciano.maiani@cern.ch

Parallel Heavy Flavors / 201

LHCb results on hadron spectroscopy, including exotic states

Corresponding Author(s): jiesheng.yu@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Upgrade / 54

LHCb upgrade

Corresponding Author(s): silvia.gambetta@cern.ch

25' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Upgrade / 294

LHCeC

Corresponding Author(s): bruce.mellado.garcia@cern.ch

Summary:

Parallel Higgs / 319

Latest results on di-Higgs production with ATLAS

Corresponding Author(s): h.fox@lancaster.ac.uk

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 320

Latest results on di-Higgs production with CMS

Corresponding Author(s): david.michael.morse@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 191

Lepton and photon ID performance at ATLAS and CMS

Corresponding Author(s): arthur.lesage@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Outreach / 347

Masterclasses in LHCb

Corresponding Author(s): francesca.dordei@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 142

Measurement of VBF Higgs boson production at $\sqrt{s}=13$ TeV in the diphoton final state with the ATLAS detector

Yu Zhang^{None}

Corresponding Author(s): zy0217@mail.ustc.edu.cn

A measurement of the VBF production cross section, performed in the framework of the Higgs simplified template cross section measurement, is made at $\sqrt{s}=13$ TeV exploiting the diphoton final state. The measurement uses the full pp collision data collected in 2015 and 2016 by the ATLAS experiment at the LHC. Special emphasis is given to the optimisation of the selection and the uncertainty estimation.

Summary:

Posters / 157

Measurement of cross section of semileptonic WW/WZ production at ATLAS and limits on anomalous gauge couplings.

Mario Campanelli¹

¹ *University College London (UK)*

Corresponding Author(s): mario.campanelli@cern.ch

We report on the measurement of the cross-section of WW and WZ bosons using data collected by ATLAS in 2012 at a center-of-mass energy of 8 TeV. The decay mode considered is where one of the W bosons decays leptonically into a light lepton and a neutrino, while the other W or the Z boson decay hadronically. Depending on the kinematic configuration, the two jets from this hadronic decay can be either reconstructed independently, or as a single high-mass jet.

Summary:

Posters / 162

Measurement of electron identification efficiencies with the 2015 and 2016 pp collisions data in ATLAS at $\sqrt{s}=13$ TeV

Savannah Jennifer Thais¹

¹ *Yale University (US)*

Corresponding Author(s): savannah.jennifer.thais@cern.ch

Efficient and accurate electron identification is of critical importance to measuring many physics processes with leptons in the final state, including $H \rightarrow 4l$, dark vector boson searches, and various SUSY searches. This poster will describe the current status of the Likelihood driven Electron ID, as well as the most recent identification efficiency and scale-factor measurements. The poster will include public results from ATLAS-CONF-2016-024 (2015 Electron ID Conf Note), and any potential public plot displaying the latest results (Moriond 2017). Additionally, it will describe planned improvements for Run 2 electron ID, highlighting improvements in the low p_T region.

Summary:

Posters / 140

Measurement of fiducial and differential cross sections in the $H \rightarrow \gamma\gamma$ decay channel with 13 TeV proton-proton collision data with the ATLAS detector

Cong Peng¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): cong.peng@cern.ch

This poster presents fiducial and differential cross-section measurements of the Higgs boson in the $H \rightarrow \gamma\gamma$ decay channel, using proton-proton collisions recorded at a 13 TeV centre-of-mass energy during 2015 and 2016. The amount of background, mainly from SM diphoton production and hadronic jets, is determined by a simultaneous signal and background fit to the diphoton mass spectrum. The fiducial cross-sections are measured in different phase space regions, and differentially as functions of a selection of variables. Differential distributions are used to probe kinematic properties, associated jet activity, and spin/CP nature of the Higgs boson. The data are compared to several state-of-the-art theoretical predictions of SM Higgs boson production.

Summary:

Posters / 141

Measurement of simplified template cross sections in the $H \rightarrow \gamma\gamma$ decay channel with 13 TeV proton-proton collision data with the ATLAS detector

Huijun Zhang¹

¹ *Universite de Paris-Sud 11 (FR)*

Corresponding Author(s): huijun.zhang@cern.ch

This poster presents the measurement of the Higgs boson simplified template production cross sections in the diphoton decay channel, using data collected in 2015 and 2016 at $\sqrt{s}=13$ TeV by the ATLAS experiment at LHC. Categories are defined to isolate various fiducial regions related to different production modes. In addition, the signal strength, defined as the ratio of the observed signal yield to the expected signal yield, is measured for those production processes as well as globally.

Summary:

Posters / 283

Measurement of the Underlying Event in pp collisions at $\sqrt{s} = 13$ TeV with the ALICE experiment at the LHC

Xiaowen Ren¹

¹ Central China Normal University CCNU (CN)

Corresponding Author(s): xiaowen.ren@cern.ch

Large In LHC RUN II, the Large Hadron Collider restarted with luminosities close to the nominal performances, and with a centre-of-mass energy increase of around 60% with respect to the end of the LHC RUN I. At this new energy it is absolutely essential to restudy the general features of the pp interaction, in particular the soft or semi-hard bulk of particles that form the Underlying Event, which is defined to be the complementary activity with respect to the leading interaction.

The measurement of the Underlying Event allows us to access fundamental information on the hadron structure. This has important consequences for lepton and photon isolation, and also for jet calibration.

In order to estimate the contributions of the Underlying Event, we present a characterization of the event properties focusing on the orthogonal plane with respect to the beam direction: the primary charged particle with the highest transverse momentum - defined to be the leading charged particle - is used to give the energy scale of the interaction. Primary charged particle and energy densities are measured in different azimuthal regions with respect to the leading charged particle.

In this poster, the performance results relevant to Underlying Event measurement in pp collisions at $\sqrt{s} = 13$ TeV will be shown.

Summary:

Parallel QCD / 233

Measurements of associated production of vector bosons and jets in CMS

Corresponding Author(s): m.ahmad@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 282

Measurements of charm mixing and CP violation using $D^0 \rightarrow K \pm \pi \mp$ decays

Adam Davis¹

¹ Tsinghua University (CN)

Corresponding Author(s): adam.davis@cern.ch

Measurements of charm mixing and CP violation parameters from the decay-time-dependent ratio of $D^0 \rightarrow K^+ \pi^-$ to $D^0 \rightarrow K^- \pi^+$ decay rates and the charge-conjugate ratio are reported. The

analysis uses $\bar{B} \rightarrow D^{*+} \mu^- X$, and charge-conjugate decays, where $D^{*+} \rightarrow D^0 \pi^+$, and $D^0 \rightarrow K^\mp \pi^\pm$. The pp collision data are recorded by the LHCb experiment at center-of-mass energies $\sqrt{s} = 7$ and 8 TeV corresponding to an integrated luminosity of 3-fb^{-1} . The data are analyzed under three hypotheses: (i) mixing assuming CP symmetry, (ii) mixing assuming no direct CP violation in the Cabibbo-favored or doubly Cabibbo-suppressed decay amplitudes, and (iii) mixing allowing either direct CP violation and/or CP violation in the superpositions of flavor eigenstates defining the mass eigenstates. The data are also combined with those from a previous LHCb study of $D^0 \rightarrow K \pi$ decays from a disjoint set of D^{*+} candidates produced directly in pp collisions. In all cases, the data are consistent with the hypothesis of CP symmetry.

Summary:

Parallel Heavy Flavors / 196

Measurements of heavy flavour and quarkonia production in pp collisions at ALICE

Corresponding Author(s): antoine.lardeux@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 197

Measurements of heavy flavour production in pp collisions at ATLAS

Corresponding Author(s): james.catmore@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 198

Measurements of heavy flavour production in pp collisions at LHCb

Corresponding Author(s): yanxi.zhang@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 221

Measurements of jet production properties in CMS

Corresponding Author(s): patrick.connor@desy.de

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 230

Measurements of particle production, soft QCD, and double parton scattering with LHCb

Corresponding Author(s): liupan.an@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 228

Measurements of particle production, underlying event and double parton scattering in CMS

Corresponding Author(s): marc.dunser@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 161

Measurements of photon identification efficiencies with the 2015 and 2016 pp collision data in ATLAS at $\sqrt{s} = 13$ TeV

Shuo Han¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): shuo.han@cern.ch

This poster presents the techniques to measure the photon identification efficiencies in the ATLAS experiment, on the proton-proton collisions collected at $\sqrt{s} = 13$ TeV, with an integrated luminosity of 3.2 fb⁻¹ and 33.3fb⁻¹ corresponding to 2015 and 2016. Three independent analyses have been exploited. One uses photons from radiative $Z \rightarrow l\bar{l}$ decays. The second extracts the shower shape properties of electrons from $Z \rightarrow e\bar{e}$ decays and extrapolates them to photons. The third directly measures the efficiency on samples of reconstructed photons, after determining and subtracting the hadronic background with a technique based on track isolation. The results from all analyses are then compared with each other and with the prediction from the simulation.

Summary:

Posters / 285

Measurements of the CP violating phase ϕ_s at LHCb

Author(s): Mengzhen Wang¹

Co-author(s): Marco Gersabeck²; LHCb collaboration

¹ *Tsinghua University (CN)*

² *University of Manchester (GB)*

Corresponding Author(s): mengzhen.wang@cern.ch, marco.gersabeck@cern.ch

The measurement of the mixing-induced CP-violating phase ϕ_s in the B_s - B_s^* system is one of the key goals of the LHCb experiment. It has been measured exploiting the Run I data set, using several decay channels. The poster shows the most recent results obtained analyzing $B_s^0 \rightarrow J/\psi K^+K^-$ candidates in the K^+K^- mass region above the $\phi(1020)$ resonance. The poster also shows previous measurements using the same final state with the K^+K^- mass at the $\phi(1020)$, as well as using the $B_s^0 \rightarrow J/\psi \pi^+\pi^-$ decays. Finally, a combination of the various results is presented.

Summary:

Parallel Heavy Flavors / 205

Mixing and CP violation results in Charm decays at LHCb

Corresponding Author(s): silvia.borghini@cern.ch

15' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 206

Mixing and CP violation results in b-hadron decays at LHCb

Corresponding Author(s): xuesong.liu@cern.ch

15' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 277

Mono-Higgs search at LHC with the CMS detector

Nicolo' Trevisani¹

¹ *Universidad de Cantabria (ES)*

Corresponding Author(s): nicolo.trevisani@cern.ch

We discuss a search for a dark matter (DM) pair production in association with a 125-GeV Higgs boson using the data collected at 13 TeV at the LHC using the CMS detector. This signature, dubbed “mono-Higgs,” appears as a single Higgs boson plus missing energy from DM particles escaping the detector. The search exploits the large missing transverse energy and other kinematic variables to separate potential signal from the large SM background. The results are interpreted in the context of different simplified physics models.

Summary:

Parallel QCD / 225

Monte Carlo developments and resummation

Corresponding Author(s): hirschva@itp.phys.ethz.ch, valentin.hirschi@gmail.com, valentin.hirschi@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 352

Monte Carlo modelling of Standard Model multi-boson production processes for 13~TeV ATLAS Analyses

Shu Li¹ ; Victoria Jane Martin²

¹ *Duke University (US)*

² *University of Edinburgh (GB)*

Corresponding Author(s): shu.li@cern.ch, victoria.martin@ed.ac.uk

We present the Monte Carlo setup used by ATLAS to model multi-boson processes in 13 TeV pp collisions. The baseline Monte Carlo generators are compared with each other in key kinematic distributions of the processes under study. Sample normalisation and assignment of systematic uncertainties are discussed.

Summary:

Plenary - EWK / 30

Multi-bosons

Corresponding Author(s): joany.andreina.manjarres.ramos@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 231

Multiplicity dependence of particle production in ALICE

Corresponding Author(s): giacomo.volpe@ba.infn.it, giacomo.volpe@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 240

NNLO QCD for PT_z and ϕ^*

Corresponding Author(s): ahuss@phys.ethz.ch

A review of state-of-the-art QCD predictions for the transverse momentum of the Z boson and the ϕ^* distribution in neutral current DY production at the LHC and a critical discussion of the residual theoretical uncertainties.

Parallel EWK / 246

NNLO QCD predictions and p_T resummation for V production

Corresponding Author(s): giancarlo.ferrera@cern.ch

A review of state-of-the-art QCD predictions for the transverse momentum distribution of the Z and W bosons in single EW gauge boson production at the LHC, which include NNLO QCD corrections matched to an all-order resummation. A critical discussion of the residual theoretical uncertainties will be provided.

Parallel Searches / 111

Natural SUSY and non-standard SUSY signals at LHC

Corresponding Author(s): dpinner@gmail.com

Summary:

Closing Plenary / 66

Neutrino talk

Corresponding Author(s): caoj@ihep.ac.cn

Parallel Heavy Ions / 326

New results on collectivity with ALICE

Corresponding Author(s): omar.vazquez.rueda@cern.ch

14' Talk and 3' Discussion

Parallel Heavy Ions / 327

New results on collectivity with ATLAS

Corresponding Author(s): krzysztof.wozniak@ifj.edu.pl

14' Talk and 3' Discussion

Parallel Heavy Ions / 328

New results on collectivity with CMS

Corresponding Author(s): jovan.milosevic@fys.uio.no

14' Talk and 3' Discussion

Parallel Heavy Ions / 329

New results on collectivity with LHCb

Corresponding Author(s): renata.kopecna@cern.ch

14' Talk and 3' Discussion

Parallel Heavy Ions / 340

New results on heavy flavor in heavy ion collisions with LHCb

Corresponding Author(s): jia-jia.qin@cern.ch

15' Talk and 5' Discussion

Summary:

Parallel Heavy Ions / 337

New results on initial state & quakonium with ALICE

Corresponding Author(s): giuseppe.trombetta@cern.ch

15' Talk and 5' Discussion

Parallel Heavy Ions / 338

New results on initial state & quakonium with ATLAS

Corresponding Author(s): sebastian.tapia.araya@cern.ch

15' Talk and 5' Discussion

Parallel Heavy Ions / 339

New results on initial state & quakonium with CMS

Corresponding Author(s): songkyo.lee@cern.ch

15' Talk and 5' Discussion

Parallel Heavy Ions / 331

New results on jets and heavy flavor in heavy ion collisions with ALICE

Corresponding Author(s): salvatore.aiola@cern.ch

15' Talk and 3' Discussion

Parallel Heavy Ions / 332

New results on jets and heavy flavor in heavy ion collisions with ATLAS

Corresponding Author(s): anne.marie.sickles@cern.ch

15' Talk and 3' Discussion

Parallel Heavy Ions / 333

New results on jets and heavy flavor in heavy ion collisions with CMS

Corresponding Author(s): yongsun.kim@cern.ch

15' Talk and 3' Discussion

Parallel Performance / 184

Novel LHCb strategy for particle identification and its performance

Corresponding Author(s): fabio.ferrari@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 105

PandaX-III Prototype detector

Heng Lin¹

¹ *Shanghai Jiao Tong University*

Corresponding Author(s): linheng@sjtu.edu.cn

The PandaX-III experiment is a high pressure TPC to search for neutrinoless double-beta decay of Xe-136 with high energy resolution and sensitivity at the China Jin Ping underground Laboratory II (CJPL-II). A prototype was built to demonstrate this concept. Microbulk Micromegas are used as a charge amplification and readout system of the prototype in order to reconstruct both the energy and track of the neutrinoless double-beta decay event. It was recently tested with gamma source at SJTU to calibrate the PandaX-III TPC and Micromegas performance.

Summary:

Posters / 103

PandaX-III neutrinoless double beta decay experiment

Shaobo WANG^{None}

Corresponding Author(s): shaobo.wang@sjtu.edu.cn

The PandaX-III is a high pressure TPC concept to search for neutrinoless double-beta decay of Xe136 with high energy resolution and sensibility at the China Jin Ping underground Laboratory II (CJPL-II). Microbulk Micromegas will be used as a charge amplification and readout system in order to reconstruct both the energy and track of the neutrinoless double-beta decay event. In the first phase of the experiment, the detector, which contains 200 kg of 90% Xe-136 enriched gas operated at 10 bar, will be immersed in a large water tank to ensure 5 m of water shielding, so that we could get an excellent control over backgrounds. And for the next phase, a ton-scale experiment with multiple TPCs will be constructed to improve the detection probability and sensibility.

Summary:

Parallel Outreach / 349

Panel discussion

The speakers are invited to participate and the audience will have the opportunity to ask specific questions.

The topics will include

- Communicating our physics program to audiences (Physics with/beyond the Higgs, New Physics)
- Desired impact of communications
- Accessing new audiences with LHC and the experiments

Summary:

Parallel Outreach / 344

Particle Physics Masterclasses for the Intl. Day of Women and Girls in Science'

Corresponding Author(s): julia.isabell.hofmann@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 195

Particle identification performance at ALICE

Corresponding Author(s): elena.botta@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 165

Performance of the ATLAS hadronic Tile calorimeter

Michaela Mlynarikova¹

¹ *Charles University (CZ)*

Corresponding Author(s): michaela.mlynarikova@cern.ch

The Tile Calorimeter (TileCal) of the ATLAS experiment at the LHC is the central hadronic calorimeter designed for reconstruction of hadrons, jets, tau-particles and missing transverse energy. TileCal is a scintillator-steel sampling calorimeter and it covers the region of pseudorapidity < 1.7 . The scintillation light produced in the scintillator tiles is transmitted by wavelength shifting fibers to photomultiplier tubes (PMTs). The analog signals from the PMTs are amplified, shaped and digitized by sampling the signal every 25 ns. The TileCal frontend electronics reads out the signals produced by about 10000 channels measuring energies ranging from ~ 30 MeV to ~ 2 TeV. Each stage of the signal production from scintillation light to the signal reconstruction is monitored and calibrated.

The performance of the calorimeter has been studied in-situ employing cosmic ray muons and a large sample of proton-proton collisions acquired during the operations of the LHC. Prompt isolated muons of high momentum from electroweak bosons decays are employed to study the energy response of the calorimeter at the electromagnetic scale. The calorimeter response to hadronic particles is evaluated with a sample of isolated hadrons and the modelling of the response by the Monte Carlo simulation is discussed. The calorimeter timing calibration and resolutions are studied with jets.

Results on the calorimeter operation and performance are presented, including the calibration, stability, absolute energy scale, uniformity and time resolution. These results show that the TileCal performance is within the design requirements and has given essential contribution to reconstructed objects and physics results.

Summary:

Parallel Upgrade / 296

Physics at linear e+e- colliders

Corresponding Author(s): gaoyin@tsinghua.edu.cn

Summary:

Parallel QCD / 234

Physics with jets in LHCb

Corresponding Author(s): xabier.cid.vidal@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 306

Predictions for exclusive Higgs cross sections

Corresponding Author(s): emanuele.re@cern.ch

14' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 267

Probe CP violation through forward-backward asymmetry in $h \rightarrow \gamma Z \rightarrow \gamma l^- l^+$ process

xuan chen¹ ; gang li² ; xia wan³

¹ *Institute of Theoretical Physics & State Key Laboratory of Nuclear Physics and Technology, Peking University, Beijing 100871, China*

² *Institute of Theoretical Physics & State Key Laboratory of Nuclear Physics and Technology, Peking University, Beijing 100871, China*

³ *School of Physics & Information Technology, Shaanxi Normal University, Xi'an 710119, China*

Corresponding Author(s): xuan.chen@pku.edu.cn, wanxia@snnu.edu.cn, gangli@pku.edu.cn

We show that the forward-backward asymmetry (A_{FB}) of the charged lepton in $gg \rightarrow H \rightarrow \gamma Z \rightarrow \gamma l^- l^+$ process could be used to probe the CP violating $H\gamma Z$ coupling when the interference of $gg \rightarrow \gamma Z \rightarrow \gamma l^- l^+$ process is included. In the presence of CP violation in $H\gamma Z$ coupling, the interference has a non-vanishing forward-backward asymmetry (A_{FB}), which is also sensitive to the strong phase differences. The resonant and non-resonant strong phases together make A_{FB} change sign around Higgs mass M_H . We propose the integral over one-side mass region below (or above) M_H to get a larger A_{FB} .

Summary:

Plenary - Heavy Flavors / 45

Production and Spectroscopy (incl. Tetra/Pentaquarks)

Corresponding Author(s): zhenwei.yang@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 281

Production of Vector-like Quark Production at the LHC, Beyond the Narrow Width Approximation.

Stefano Moretti¹ ; Dermot O'Brien¹ ; Luca Panizzi² ; Hugo Prager¹

¹ *University of Southampton*

² *University of Genova*

Corresponding Author(s): prager.hugo@gmail.com, doob1e14@soton.ac.uk, s.moretti@soton.ac.uk, luca.panizzi@ge.infn.it

This paper explores effects of both finite width and interference (with background) in the production and decay of extra heavy quarks at the Large Hadron Collider (LHC). This dynamics is normally ignored in the standard experimental searches and we assess herein the regions of validity of current approaches. Further, we discuss the configuration of masses, widths and couplings where the latter breaks down.

Summary:

Posters / 104

Production of extra quarks decaying to Dark Matter at the LHC beyond the Narrow Width Approximation

Hugo Prager¹ ; Stefano Moretti² ; Luca Panizzi¹ ; Dermot O'Brien¹

¹ *University of Southampton*

² *STFC - Rutherford Appleton Lab. (GB)*

Corresponding Author(s): doob1e14@soton.ac.uk, stefano.moretti@cern.ch, l.panizzi@soton.ac.uk, prager.hugo@gmail.com

Studying how ATLAS and CMS searches for supersymmetry in the $t\bar{t} + \text{MET}$ final state constrain scenarios with a fermionic top partner and a dark matter candidate, we show that the efficiencies of the considered searches are quite similar for scalar and fermionic top partners. Therefore, in general, efficiency maps for stop-neutralino simplified models can also be applied to fermionic top-partner models, provided the narrow width approximation holds in the latter. This motivates the exploration of finite width effects in the production and decay of extra heavy quarks at the LHC, this dynamics being normally ignored in standard experimental searches. For this reason we assess the regions of validity of current approaches and study the impact of the Dark Matter candidate spin on the exclusion.

Summary:

Parallel QCD / 232

Production of vector bosons in association with jets in ATLAS

Corresponding Author(s): evelin.meoni@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - QCD / 16

Progress with QCD calculations for the LHC

Corresponding Author(s): gudrun.heinrich@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Heavy Flavors / 204

Properties of HF decays at CMS

Corresponding Author(s): nuno.leonardo@cern.ch

15' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 252

Pros and cons of EFT interpretation of multiboson production at LHC

Corresponding Author(s): martin.gonzalez.alonso@cern.ch

A discussion of the conditions for an effective field theory (EFT) to give an adequate low-energy description of an underlying physics beyond the Standard Model and how experimental results for multi-boson production could be reported, so that they admit a maximally broad range of theoretical interpretations in a wide range of energy scales. The talk should also include a discussion on global EFT analyses of Higgs + TGC data.

Parallel Performance / 183

Proton tagging in the forward region: prospect and performance

Corresponding Author(s): mirko.berretti@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - QCD / 19

QCD with ALICE and LHCb

Corresponding Author(s): paolo.bartalini@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 251

QCD+EW predictions for multiboson production

Corresponding Author(s): pozzorin@physik.uzh.ch

A review of state-of-the-art QCD and EW predictions for multi-boson production and a discussion of the remaining open issues in providing precision SM predictions for multi-boson processes at the LHC.

Plenary - Heavy Ions / 24

Quarkonia and HF

Corresponding Author(s): andrea.festanti@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 212

Rare B decays at CMS

Corresponding Author(s): li.linwei@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Heavy Flavors / 43

Rare decays

Corresponding Author(s): kai-feng.chen@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Heavy Flavors / 213

Rare decays at LHCb

Corresponding Author(s): marcin.jakub.chrzaszcz@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Higgs / 14

Rare production and decay channels

Corresponding Author(s): anthony.morley@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 193

Real-time physics: performance and novel developments at LHCb experiment

Corresponding Author(s): roel.aaij@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 76

Recent developments in Monte Carlo tools for top quark processes

Corresponding Author(s): lindert@mppmu.mpg.de, lindert@physik.uzh.ch

15' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - QCD / 20

Recent progress in PDFs

Corresponding Author(s): j.rojo@vu.nl

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - Top / 50

Recent progress in the theoretical description of top quark production

Corresponding Author(s): yanglilin@pku.edu.cn

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Heavy Flavors / 207

Recent results from Tevatron

Corresponding Author(s): tsybych@sbhep.physics.sunysb.edu, tsybych@fnal.gov

15' Talk +3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Closing Plenary / 65

Report from the International Advisory Committee (IAC)

Corresponding Author(s): gregorio.bernardi@cern.ch

Posters / 150

SEARCH FOR DISPLACED LEPTON_JETS WITH THE ATLAS EXPERIMENT

Daniela Salvatore¹

¹ *Universita della Calabria (IT) - INFN*

Corresponding Author(s): daniela.salvatore@cern.ch

Several possible extensions of the Standard Model predict the existence of a dark sector that is weakly coupled to the visible one: i.e. the two sectors couple via the vector portal, where a dark photon with mass in the MeV to GeV range mixes kinetically with the SM photon. If the dark photon is the lightest state in the dark sector, it will decay to SM particles, mainly to leptons and possibly light mesons. Due to its weak interactions with the SM, it can have a non-negligible lifetime. At the LHC, these dark photons would typically be produced with large boost resulting in collimated jet-like structures containing pairs of leptons and/or light hadrons, the so-called lepton-jets (LJs).

This work is focused on the search for “displaced LJs”, which are produced away from the interaction point and their constituents are limited to electrons, muons, and pions. The requested topology includes one or two LJs + leptons/jets/MET. The most recent ATLAS results based on samples collected at a center of mass energy of 13 TeV will be presented.

Results are interpreted in terms of the Falkowsky-Ruderman-Volansky-Zupan models where dark photons are generated through the decay of a Higgs boson to intermediate hidden fermions. The Higgs boson is supposed to be produced via gluon-fusion and for the first time, results are also presented in terms of the associated production of a Higgs boson with a W/Z and in the context of inelastic thermal relic dark matter.

Summary:

Posters / 151

SEARCHING FOR NEW HIGH MASS PHENOMENA DECAYING TO MUON PAIRS USING PROTON-PROTON COLLISIONS AT $\sqrt{s} = 13$ TEV WITH THE ATLAS DETECTOR AT THE LHC

Sebastien Rettie¹

¹ *University of British Columbia (CA)*

Corresponding Author(s): sebastien.rettie@cern.ch

The Standard Model (SM) of particle physics is a very successful predictive theory which explains the fundamental interactions of elementary particles in the universe, except for gravity. However, the SM is known to be an effective theory that is valid only in a low energy regime, called the electroweak scale, and does not account for many observed experimental results. For example, it does not offer a satisfying explanation for neutrino masses or dark matter. Hence, it is clear that to fully understand and explain nature, a theoretical framework that goes beyond the Standard Model (BSM) is required. While high mass resonances do not offer a complete solution to the problems mentioned above, many BSM theories predict their existence. To name a few, extra dimensional models, grand unified theories, and supersymmetric models all have the common goal of reconciling the very different scales of electroweak symmetry breaking and high mass scales, and predict the existence of high mass resonances. Thus, finding high mass resonances would help validate these theories, which do offer solutions to the aforementioned problems. This analysis focuses on searching for new high mass phenomena using the latest data collected by the ATLAS detector at the LHC, which has an unprecedented centre-of-mass energy of 13 TeV and corresponds to 36.5 fb^{-1} at $\sqrt{s} = 13 \text{ TeV}$. The search is conducted for both resonant and non-resonant new phenomena in dimuon final states. The dimuon invariant mass spectrum is the discriminating variable used in this search. No significant deviations from the Standard Model expectation are observed. Lower limits are set on the signal parameters of interest at 95% credibility level, using a Bayesian interpretation.

Summary:

Posters / 265

SM Higgs boson decays to taus at CMS

Cecile Sarah Caillol¹

¹ *University of Wisconsin-Madison (US)*

Corresponding Author(s): cecile.caillol@cern.ch

A search for a standard model Higgs boson decaying into a pair of tau leptons is performed using events recorded by the CMS experiment at the LHC in 2016. The dataset corresponds to an integrated luminosity of 35.9 fb^{-1} at a center-of-mass energy of 13 TeV. Each tau lepton decays hadronically or leptonically, and the four final states with the largest branching fractions are considered.

Summary:

Plenary - Searches / 34

SUSY 3d Generation

Corresponding Author(s): loukas.gouskos@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Searches / 116

SUSY Higgs signals

Corresponding Author(s): jan@hajer.com

Summary:

Plenary - Searches / 350

SUSY RPV

Xuai Zhuang¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): xuai.zhuang@cern.ch

20' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 118

SUSY electroweak searches with ATLAS

Corresponding Author(s): antonella.de.santo@googlemail.com

Summary:

Parallel Searches / 119

SUSY electroweak searches with CMS

Corresponding Author(s): marco.peruzzi@cern.ch

Summary:

Parallel Searches / 109

SUSY global fits

Corresponding Author(s): peter.athron@coepp.org.au, peter.athron@adelaide.edu.au

Summary:

Parallel Searches / 112

SUSY in photons and taus with CMS

Corresponding Author(s): msun@cern.ch

Summary:

Parallel Searches / 117

SUSY indirect searches with LHCb

Corresponding Author(s): hannah.mary.evans@cern.ch

Summary:

Parallel Searches / 106

SUSY strong production (hadronic) with ATLAS

Corresponding Author(s): hepglmh@ustc.edu.cn

Summary:

Parallel Searches / 107

SUSY strong production (hadronic) with CMS

Corresponding Author(s): lucien.lo@cern.ch

Summary:

Parallel Searches / 108

SUSY strong production (leptonic) with ATLAS

Corresponding Author(s): tomoyuki.saito@cern.ch

Summary:

Parallel Searches / 110

SUSY strong production (leptonic) with CMS

Corresponding Author(s): seitz.claudia@cern.ch, hannsjorg.artur.weber@cern.ch

Summary:

Parallel Upgrade / 289

SciFi: A large Scintillating Fibre Tracker for LHCb

Corresponding Author(s): plamen.hristov.hopchev@cern.ch

Summary:

Posters / 148

Search for Dark Matter Produced in Association with a Higgs Boson Decaying to $b\bar{b}$ with the ATLAS Detector

Yuan-Tang Chou¹

¹ National Tsing Hua University (TW)

Corresponding Author(s): yuan-tang.chou@cern.ch

A search for dark matter produced in association with a Higgs Boson decaying into a pair of bottom quarks is presented, using 36.5 fb⁻¹ of pp collisions at a center-of-mass of 13 TeV. The Higgs boson provides a unique way to probe the production of Dark Matter particles at Large Hadron Collider. The decay of the Higgs boson is reconstructed as a high-momentum $b\bar{b}$ system with either a pair of small-radius jets or a single large-radius jet with substructure. The results are interpreted in the context of a simplified model which describes the interaction of dark matter and standard model particles via new, heavy mediator particles.

Summary:

Posters / 299

Search for Higgs boson pair production in the final state of $\gamma\gamma WW^*(\rightarrow l\nu jj)$ using collision data recorded at $\sqrt{s}=13$ TeV with the ATLAS detector

Qi Li¹

¹ Chinese Academy of Sciences (CN)

Corresponding Author(s): qi.li@cern.ch

This poster presents a search for resonant and non-resonant Higgs boson pair production with one Higgs boson decaying to WW and the other one to $\gamma\gamma$. The dataset consists of proton-proton collisions recorded at a 13 TeV centre-of-mass energy during 2015 and 2016.

Summary:

Posters / 171

Search for SIMPs Using Trackless Jets at the CMS Experiment

Isabelle Helena J De Bruyn¹ ; Giannis Flouris¹ ; Nadir Daci¹ ; Steven Lowette¹

¹ *Vrije Universiteit Brussel (BE)*

Corresponding Author(s): isabelle.helena.j.de.bruyn@cern.ch, steven.lowette@cern.ch, giannis.flouris@cern.ch, nadir.daci@cern.ch

The existence of Dark Matter in the form of Strongly Interacting Massive Particles (SIMPs) can be motivated by astrophysical observations that challenge the classical Cold Dark Matter scenario. Although other observations greatly constrain this alternative, they do not completely exclude it. The signature of SIMPs at CMS consists of pair-produced neutral, hadron-like, trackless jets. The absence of charged content in this type of jets provides a very efficient tool to suppress the QCD dijet background. We present the search for this signal, which was performed using the 2016 CMS data.

Summary:

Parallel Searches / 130

Search for VLQs in ATLAS and CMS

Corresponding Author(s): sophio.patarai@cern.ch

15' talk and 3' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 217

Search for a Standard Model Higgs boson produced in association with a vector boson and decaying to a pair of b-quarks in pp collisions at 13 TeV using the ATLAS detector

Yanhui Ma¹

¹ *Shandong University (CN)*

Corresponding Author(s): yanhui.ma@cern.ch

A search for the decay of the Standard Model Higgs boson into a bb pair when produced in association with a W or Z boson has been performed with the ATLAS detector. Data were collected in proton-proton collisions from Run 2 of the Large Hadron Collider at a centre-of-mass energy of 13 TeV, final states are considered that contain 0, 1 and 2 charged leptons (electrons or muons), targeting the decays: $Z \rightarrow \nu\nu$, $W \rightarrow l\nu$, and $Z \rightarrow ll$. In the 1 lepton(WH) channel, the multijet background contributes a significant fraction of the background events, the optimization of the selections for multijet rejection has been studied, and data driven approaches are used to estimate it due to difficulties encountered to model this background.

Summary:

Posters / 300

Search for a high mass Higgs boson in the $H \rightarrow WW \rightarrow e \nu \mu \nu$ channel in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector

Yongke Zhao¹

¹ Shandong University (CN) & LAL

Corresponding Author(s): yongke.zhao@cern.ch

A search for a high-mass resonance decaying to WW is performed in the $e \nu \mu \nu$ final states using pp collision data collected at $\sqrt{s}=13$ TeV by the ATLAS detector at the Large Hadron Collider. Different hypotheses are tested, including heavy Higgs with a narrow width approximation and a large width assumption. Three orthogonal event categories are defined for the search: one ggF quasi-inclusive category where the VBF phase spaces are excluded and two VBF categories where the VBF signals are dominant.

Summary:

Posters / 178

Search for associated production of Higgs bosons and top quarks in multilepton final states at $\sqrt{s} = 13$ TeV

Jing Li¹

¹ Peking University (CN)

Corresponding Author(s): crystalli.pku@gmail.com

A search for the associated production of a standard model Higgs boson and a top quark-anti quark pair ($t\bar{t}H$), using LHC pp collision data collected by the CMS experiment at a center of mass energy of 13 TeV in 2016. The dataset corresponds to an integrated luminosity of 12.9 fb^{-1} . The analysis uses events with two leptons of the same charge or at least three charged leptons, produced together with b jets, targeting Higgs boson decay modes to WW^* , ZZ^* , and $\tau\tau$ and leptonic decays of at least one of the top quarks. The results are combined with the 2015 dataset/ The signal strength and a 95% confidence level upper limit on the signal production cross section are presented

Summary:

Posters / 153

Search for di-jet resonances with one or two jets identified as b-jets in proton-proton collisions at 13 TeV with the ATLAS detector

Haijun Yang¹

¹ Shanghai Jiao Tong University (CN)

Corresponding Author(s): haijun.yang@cern.ch

Several models beyond the Standard Model predict heavy particles decaying to b jets. This poster presents the searches for resonances in the di-jet invariant mass spectrum with one or two jets identified as b-jets. The search is performed using proton-proton collisions data with a

centre-of-mass energy of 13 TeV recorded by the ATLAS detector in the years 2015 and 2016 at the Large Hadron Collider.

Summary:

Posters / 260

Search for direct top squark pair production in the fully hadronic final state in 35.9 fb^{-1} of pp collision data at 13 TeV with the CMS experiment

Huilin Qu¹

¹ *Univ. of California Santa Barbara (US)*

Corresponding Author(s): huilin.qu@cern.ch

A search for direct production of top squark pairs in events with jets and large transverse momentum imbalance is presented. The data were collected in proton-proton collisions at a center-of-mass energy of 13 TeV and correspond to an integrated luminosity of 35.9 fb^{-1} . Dedicated object reconstruction tools are developed to exploit the unique signal characteristics. No significant excess of events above the standard model expectation is observed. Exclusion limits are set in the context of simplified models of top squark pair production under various decay hypotheses.

Summary:

Posters / 278

Search for electroweak production SUSY in same-sign dileptons and multilepton final states with CMS

Juan Gonzalez¹

¹ *Universidad de Oviedo (ES)*

Corresponding Author(s): juan.rodriigo.gonzalez.fernandez@cern.ch

Searches are presented for direct electroweak production of charginos and neutralinos in signatures with two light leptons of the same charge and with three or more leptons including up to two hadronically decaying τ leptons. The full 2016 dataset of pp collisions recorded by CMS at a center-of-mass energy of 13 TeV is used, corresponding to an integrated luminosity of 35.9 fb^{-1} . The observed event rates are in agreement with expectations from the standard model. These results probe charginos and neutralinos with masses up to values between 225 and 1150 GeV, depending on the model parameters assumed.

Summary:

Posters / 149

Search for heavy Higgs bosons decaying into a top quark pair in ATLAS

Jike Wang¹

¹ *Deutsches Elektronen-Synchrotron (DE)*

Corresponding Author(s): jike.wang@cern.ch

Still many things in our nature can not be explained by the Standard Model. Many of these conundrums could be addressed by some of the best motivated models currently under exploration, such as super-symmetry (SUSY), composite Higgs models and extended Higgs models such as two-Higgs doublet models (2HDM). Most of these extensions require additional scalar bosons. In particular, the 2HDM proposes two new heavier neutral Higgs bosons, a scalar H and a pseudoscalar A. $t\bar{t}$ is a very important (or say dominant) decaying channel of A/H, especially for low $\tan\beta$. Searches for A/H through the $gg \rightarrow A/H \rightarrow t\bar{t}$ process are very challenging due to the peculiar behaviour of the large interference effects with the SM $t\bar{t}$ background. Such effects distort the signal shape from the normal peak-structure to be peak-dip co-existing, which makes the signal generation and statistics treatment very different from the traditional ways. The invariant mass of the $t\bar{t}$ candidate pair is reconstructed under the assumption of a semi-leptonic $t\bar{t}$ decay. The final state is characterised by a single, high-pT electron or muon, large MET, and at least four jets. The analysis will be presented, it is also the first A/H $\rightarrow t\bar{t}$ searching result at LHC. The results are further interpreted in the type-II 2HDM model, on the $\tan\beta$ exclusion for several different A/H masses.

Summary:

Posters / 143

Search for high-mass $Z\gamma$ resonances and for the $Z\gamma$ decays of the 125 GeV Higgs boson in di-lepton plus photon final states with 13 TeV pp collisions with the ATLAS detector

Shuo Han¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): shuo.han@cern.ch

his poster presents a search for new resonances decaying to $Z\gamma$ and for the decays to $Z\gamma$ of the 125 GeV Higgs boson. The Z bosons are identified through their decays to charged, light lepton pairs (e^+e^- , $\mu^+\mu^-$). The dataset consists of proton-proton collisions collected at $\sqrt{s}=13$ TeV with the ATLAS detector at the Large Hadron Collider. The searches are performed by looking for localised excesses in the invariant mass of the three-body final state $l\bar{l}\gamma$, $l=e,\mu$, over a smoothly-falling background arising from Standard Model background expectation.

Summary:

Posters / 139

Search for neutral MSSM Higgs bosons decaying to a tau-antitau pair in the ATLAS detector produced with 13 TeV proton-proton collisions at the LHC

Theodore Zorbas¹

¹ *University of Sheffield (GB)*

Corresponding Author(s): t.zorbas@cern.ch

We present the latest results in the search for Minimal Supersymmetric Standard Model (MSSM) neutral Higgs bosons decaying to a tau-antitau pair ($H/A \rightarrow \tau\tau$). We consider tau-pair decays in the Leptonic-Hadronic (LepHad) and Hadronic-Hadronic (HadHad) modes. We analyse Run 2 data recorded with the ATLAS detector, produced with proton-proton collisions at a centre-of-mass energy of 13 TeV at the Large Hadron Collider (LHC). The background theory of the MSSM will be introduced as an extension to the Standard Model (SM) predicting these additional Higgs bosons with masses heavier than the SM Higgs Boson. The resulting limits on the production rates of the MSSM Higgs boson, which are used to constrain the theory, will be presented.

Summary:

Posters / 147

Search for new phenomena in different-flavour high-mass dilepton final states in proton-proton collisions at a centre-of-mass energy of 13 TeV

Marc Bret Cano¹

¹ *Shanghai Jiao Tong University (SJTU)*

Corresponding Author(s): marc.cano.bret@cern.ch

A search is performed for a heavy particle decaying into different flavour dilepton pairs (emu, etau or mutau), using 36.5 fb^{-1} of proton-proton collision data at a centre-of-mass energy of 13 TeV collected in 2015 and 2016 by the ATLAS detector at the Large Hadron Collider. No excess over the Standard Model prediction is observed. Limits at the 95% credibility level are set on the mass of a Z' boson with lepton-flavour-violating couplings and on the mass of a supersymmetric tau sneutrino with R-parity-violating couplings at 2.3, 2.2 and 1.9 TeV, for emu, etau and mutau final states, respectively. The results are also interpreted as limits on the threshold mass for quantum black hole production.

Summary:

Posters / 154

Search for new phenomena in dijet events with the ATLAS detector at $\sqrt{s} = 13 \text{ TeV}$

Dengfeng Zhang¹

¹ *Shandong University (CN)*

Corresponding Author(s): zhangdf1470@alipay.com

The dijet final state at high transverse momentum probes the highest energies reached in a collider experiment. This corresponds to the largest reach in mass for the production of new particles, but also to resolving the smallest distances. Several phenomena described by models of physics beyond the Standard Model could be seen in the angular and mass distributions of dijets. This poster shows recent results at $\sqrt{s} = 13 \text{ TeV}$, using data with an integrated luminosity of 3.5 fb^{-1} and 33.9 fb^{-1} ,

for the samples collected in 2015 and 2016 respectively, collected by the ATLAS detector.

Summary:

Posters / 274

Search for new physics in events with multileptons and jets in 35.9 fb⁻¹ of pp collision data at 13 TeV with the CMS experiment

Ignacio Suarez Andres¹

¹ *Universidad de Oviedo (ES)*

Corresponding Author(s): ignacio.suarez.andres@cern.ch

A search for new physics is carried out in events with ≥ 3 electrons or muons and jets. Results are based on a sample of proton-proton collision data produced by the LHC at a center-of-mass energy of 13 TeV and collected by the CMS experiment in 2016. Events are classified according to the number of b-tagged jets, missing transverse momentum, hadronic transverse energy, and the invariant mass of opposite-charge, same-flavor dilepton pairs. The results are interpreted using simplified models of supersymmetry. No significant excess above the standard model background expectation is observed.

Summary:

Parallel Searches / 342

Search for new physics in lepton+jet final states in ATLAS and CMS

Corresponding Author(s): francesco.romeo@cern.ch

15' talk and 3' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 273

Search for single production of a vector-like T quark in proton-proton collisions at 13 TeV at CMS

Aniello Spiezia¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): aniello.spiezia@cern.ch

We present a search for single production of heavy vector like quarks, carried out by the CMS collaboration analyzing LHC pp collisions at 13TeV. The vector like quark is a massive top quark partner that is searched for in a mass range between 0.7 and 1.7 TeV and a width between <1% and 30%. Single production can be dominant over pair production, depending on the mass of the new quark.

The search is performed in a variety of final states including boosted topologies that can increase the sensitivity of the analysis.

Summary:

Posters / 145

Search for squarks and gluinos in final states with two same-sign or three leptons at ATLAS

Yang Liu¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): yang.liu@cern.ch

Supersymmetry (SUSY) is a well motivated extension of the Standard Model (SM) that postulates the existence of a superpartner for each SM particle. A search for strongly produced SUSY particles decaying to a pair of two isolated same-sign leptons or three leptons has been carried out using proton-proton collisions at a centre of mass of 13 TeV collected by the ATLAS experiment. The analysis benefits from a low SM background and uses looser kinematic requirements compared to other beyond the SM searches which increases its sensitivity to scenarios with small mass differences between the SUSY particles, or in which R-parity is not conserved. The results are interpreted in the context of R-parity conserving or R-parity violating simplified signal models.

Summary:

Posters / 99

Search for supersymmetry in events with a photon, a lepton and missing transverse momentum with the CMS detector

Menglei Sun¹

¹ *Carnegie-Mellon University (US)*

Corresponding Author(s): msun@cern.ch

A search for supersymmetry in final states with a photon, lepton, and missing transverse momentum (MET) is presented. This final state is motivated by generalized models of gauge-mediated supersymmetry breaking with a wino-like next-to-lightest supersymmetric particle. Results are presented and interpreted using simplified supersymmetric models.

Summary:

Posters / 146

Search for supersymmetry in final states with two hadronically decaying tau leptons at ATLAS

Huajie Cheng¹

¹ *Chinese Academy of Sciences (CN)*

Corresponding Author(s): huajie.cheng@cern.ch

A search for the electroweak production of supersymmetric particles in final states with at least two hadronically decaying tau leptons and MET is presented. The analysis uses a dataset of proton–proton collisions recorded with the ATLAS detector at the Large Hadron Collider at a centre-of-mass energy of 13 TeV. Prospect of the search at the High Luminosity LHC with ATLAS detector with 3000fb⁻¹ will also be discussed.

Summary:

Posters / 138

Search for ttH production at $\sqrt{s}=13$ TeV with the ATLAS detector

Leonid Serkin¹

¹ *INFN Gruppo Collegato di Udine and ICTP Trieste (IT)*

Corresponding Author(s): leonid.serkin@cern.ch

A review of the searches for the SM Higgs boson produced in association with a pair of top quarks, ttH, using pp collision data at $\sqrt{s}=13$ TeV, collected with the ATLAS detector at the LHC is presented. Searches for ttH production in the diphoton and multilepton channels are summarised, and special focus is given to the most sensitive channel, with the SM Higgs boson decaying to a pair of bottom quarks.

Summary:

Parallel Higgs / 323

Searches for BSM Higgs bosons in fermion decay channels with ATLAS

Corresponding Author(s): arno.straessner@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 322

Searches for BSM Higgs bosons in fermion decay channels with CMS

Corresponding Author(s): gianni.masetti@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Higgs / 15

Searches for additional Higgs bosons

Corresponding Author(s): meng.xiao@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Searches / 123

Searches for dark matter in ATLAS

Corresponding Author(s): cristiano.alpigiani@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 122

Searches for dark matter in CMS

Corresponding Author(s): raman.khurana@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 136

Searches for diboson resonances in ATLAS

Corresponding Author(s): alexander.oh@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 137

Searches for diboson resonances in CMS

Corresponding Author(s): huanghuang_phy@pku.edu.cn

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 129

Searches for long-lived particles decaying in the detector

Corresponding Author(s): isabelle.helena.j.de.bruyn@cern.ch

15' talk and 3' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 124

Searches for new heavy resonances in final states with leptons and photons in ATLAS and CMS

Corresponding Author(s): francesco.pandolfi@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 132

Searches for new physics in dijet final states in ATLAS and CMS

Corresponding Author(s): matteo.bauce@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 125

Searches for other new phenomena in final states with leptons and photons in ATLAS and CMS

Corresponding Author(s): wojtek.fedorko@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 314

Searches for rare and exotic Higgs decays with ATLAS

Corresponding Author(s): marija.marjanovic@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Higgs / 315

Searches for rare and exotic Higgs decays with CMS

Corresponding Author(s): cecile.caillol@cern.ch

12' Talk (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Searches / 134

Searches for resonances decaying into heavy quarks in ATLAS and CMS

Corresponding Author(s): huaqiao.zhang@cern.ch

15' talk and 5' discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 257

Searches for strong production of SUSY particles with two opposite-sign same-flavor leptons at CMS

Sergio Sanchez Cruz¹

¹ *Universidad de Oviedo (ES)*

Corresponding Author(s): sergio.sanchez.cruz@cern.ch

A search is presented for physics beyond the standard model in events with two opposite-sign, same-flavor leptons, jets and missing transverse momentum in the final state. The search is performed in a dataset of 35.9 fb^{-1} of $\sqrt{s} = 13 \text{ TeV}$ pp collisions recorded by the CMS experiment along the year 2016. The search targets models in which a colored particle is produced. Models are considered, in which a kinematic edge is observed in the dilepton invariant mass and models in which a Z boson arises in the decay chain of the SUSY particles. Such searches have been performed in 8 TeV pp collisions as well as 13 TeV collisions. This version of the search adds additional event categories as well as improved background estimation procedures substantially increasing the sensitivity of the search. The results are interpreted in the context of simplified models of SUSY.

Summary:

Posters / 264

Searching for Singlino-Higgsino Dark Matter in the NMSSM

Author(s): Qian-Fei Xiang^{None}

Co-author(s): Xiao-Jun Bi ; Peng-Fei Yin ; Zhao-Huan Yu

We study a simplified scenario in the next-to-minimal supersymmetric standard model with a split electroweak spectrum, in which only the singlino and higgsinos are light and other superpartners are decoupled. Serving as a dark matter candidate, a singlino-dominated neutralino $\tilde{\chi}_1^0$ should have either resonant annihilation effects or sizable higgsino components to satisfy the observed relic abundance. The sensitivities of LHC searches and dark matter detection experiments are investigated. With an integrated luminosity of 30 (300) fb^{-1} , $3l + E_T$ and $2l + E_T$ searches at the 13~(14)-TeV LHC are expected to reach up to $m_{\tilde{\chi}_1^0} \sim 150$ (270) GeV and $m_{\tilde{\chi}_2^0, \tilde{\chi}_1^\pm} \sim 320$ (500) GeV. Near future dark matter direct and indirect detection experiments are promising to cover the parameter regions where collider searches lose their sensitivities.

Summary:

Posters / 167

Simulation of the ATLAS New Small Wheel (NSW) System

ATLAS Collaboration¹

¹ ATLAS

Corresponding Author(s): marek.tasevsky@cern.ch

The instantaneous luminosity of the Large Hadron Collider (LHC) at CERN will be increased up to a factor of five with respect to the present design value by undergoing an extensive upgrade program over the coming decade. In order to benefit from the expected high luminosity performance that will be provided by the Phase-1 upgraded LHC, the first station of the ATLAS muon end-cap Small Wheel system will need to be replaced by a New Small Wheel (NSW) detector. The NSW is going to be installed in the ATLAS detector in the forward region of $1.3 < |\eta| < 2.7$ during the second long LHC shutdown. The NSW will have to operate in a high background radiation region, while reconstructing muon tracks with high precision as well as furnishing information for the Level-1 trigger. A detailed study of the final design and validation of the readout electronics for a set of precision tracking (Micromegas) and trigger chambers (small-strip Thin Gap Chambers or sTGC) that are able to work at high rates with excellent real-time spatial and temporal resolution will be presented. The simulation of the entire NSW system integrated in the common ATLAS trigger simulation and reconstruction chain is a necessary part of the performed Monte Carlo (MC) studies. A dedicated parametric digitization model based on the exhaustive standalone MC studies and experimental test beam results has been developed over the years to simulate the response of the NSW system. The simulated digital readout signals are used to build the cluster hits and reconstructed track-segments in the detector planes at both the trigger and off-line reconstruction levels. They have been included in the common ATLAS muon trigger and reconstruction algorithms. This contribution will summarize the developed simulation model and the importance of the NSW system for the improvement of the muon reconstruction efficiency and muon identification.

Summary:

Posters / 160

Simulation studies for the ATLAS upgrade Strip tracker

Jike Wang¹

¹ Deutsches Elektronen-Synchrotron (DE)

Corresponding Author(s): jike.wang@cern.ch

ATLAS is making extensive efforts towards preparing a detector upgrade for the High luminosity operations of the LHC (HL-LHC), which will commence operation in ~10 years. The current ATLAS Inner Detector will be replaced by a all-silicon tracker (comprising an inner Pixel tracker and outer Strip tracker). The software currently used for the new silicon tracker is broadly inherited from that used for the LHC Run 1 and 2, but many new developments have been made to better fulfil the future detector and operation requirements. One aspect in particular which will be highlighted is the simulation software for the Strip tracker. The available geometry description software (including the detailed description for all the sensitive elements, the services, etc.) did not allow for accurate modelling of the planned detector design. A range of sensors/layouts for the Strip tracker are being considered and must be studied in detailed simulations in order to assess the performance and ascertain that requirements are met. For this, highly flexibility geometry building is required from the simulation software. A new Xml-based detector description framework has been developed to meet the aforementioned challenges. We will present the design of the framework and its validation results.

Summary:

Parallel TOP / 80

Single Top Production and Decay: QCD and LHC

Corresponding Author(s): jungao@mail.ustc.edu.cn, jung@smu.edu

15' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 237

Single boson production and differential cross sections measurements in ATLAS

Corresponding Author(s): chiara.debenedetti@cern.ch

Summary:

Parallel EWK / 238

Single boson production and differential cross sections measurements in CMS

Corresponding Author(s): kplee@cern.ch

Summary:

Parallel EWK / 239

Single boson production and differential cross sections measurements in LHCb

Corresponding Author(s): menglin.xu@cern.ch

Summary:

Plenary - Top / 49

Single top

Corresponding Author(s): carlos.escobar.ibanez@cern.ch, carlos.escobar@correo.nucleares.unam.mx

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 81

Single top other channels in ATLAS and CMS

Corresponding Author(s): kevin.finelli@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 79

Single top t-channel in ATLAS and CMS

Corresponding Author(s): nils.faltermann@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - QCD / 17

Soft QCD

Corresponding Author(s): sarka.todorova@cern.ch, sarka.todorovova@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 227

Soft QCD results in pp and pPb with ALICE

Corresponding Author(s): valentina.zaccolo@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Heavy Ions / 22

Soft probes and flow

Corresponding Author(s): roman.lietava@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 8

Standard Model Extended by a Heavy Singlet: Linear vs. Nonlinear EFT

Alejandro Celis¹ ; Oscar Cata^{None} ; Claudius Krause² ; Gerhard Buchalla³

¹ *IFIC CSIC-Universitat de Valencia*

² *IFIC Valencia*

³ *LMU Munich*

Corresponding Author(s): gerhard.buchalla@lmu.de, claudius.krause@ific.uv.es, alejandro.celis@physik.uni-muenchen.de, oscar.cata@physik.uni-muenchen.de

I consider the Standard Model extended by a heavy scalar singlet and derive the low-energy effective theory resulting from integrating out the heavy state. This exercise in effective field theory serves to illustrate with a simple example the systematics of the linear and nonlinear electroweak effective Lagrangians and to clarify the relation between them. I discuss power-counting aspects and the transition between both effective theories on the basis of the model.

Summary:

Parallel Performance / 181

State-of-the-art Machine Learning in event reconstruction and object identification

Corresponding Author(s): michael.aaron.kagan@cern.ch

20' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Searches / 32

Strong SUSY

Corresponding Author(s): seitz.claudia@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Posters / 351

Studies of $Z\gamma$ electroweak production in association with a high-mass dijet system in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector

Shu Li¹ ; Victoria Jane Martin²

¹ *Duke University (US)*

² *University of Edinburgh (GB)*

Corresponding Author(s): shu.li@cern.ch, victoria.martin@ed.ac.uk

The production of a Z boson and a photon in association with a high-mass dijet system is studied using 20.2 fb^{-1} of proton-proton collision data at a centre-of-mass energy of $\sqrt{s} = 8$ TeV recorded with the ATLAS detector in 2012 at the Large Hadron Collider. Final states with a photon and a Z boson decaying into a pair of either electrons, muons, or neutrinos are analysed. Electroweak and total $pp \rightarrow Z\gamma jj$ cross-sections are extracted in two fiducial regions with different sensitivities to electroweak production processes. Quartic couplings of vector bosons are studied in regions of phase space with an enhanced contribution from pure electroweak production, sensitive to vector-boson scattering processes $VV \rightarrow Z\gamma$. No deviations from Standard Model predictions are observed and constraints are placed on anomalous couplings parameterized by higher-dimensional operators using effective field theory.

Summary:

Parallel Heavy Flavors / 211

Study of $b \rightarrow s \ell\ell$ decays at ATLAS

Corresponding Author(s): marcella.bona@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 216

Study of Higgs boson properties in $H \rightarrow ZZ^{(*)} \rightarrow 4l$ decay channel with ATLAS

Kirill Prokofiev¹

¹ *The Hong Kong University of Science and Technology (HK)*

Corresponding Author(s): kirill.prokofiev@cern.ch

After the discovery of the Higgs boson, the precision measurements of its properties and comparison of results to those predicted by the Standard Model (SM) became the crucial part of the LHC physics programme. Potential observation of deviations may lead to the discovery of a new physics beyond the Standard Model (BSM). In this contribution, the results of analyses of the Higgs boson properties in $H \rightarrow ZZ^{(*)} \rightarrow 4l$ decay channel are presented. The measurements of Higgs SM couplings, fiducial and differential cross sections with 36.1 fb⁻¹ of data collected by ATLAS at $\sqrt{s} = 13$ TeV are shown. The observed limits on BSM tensor structure of Higgs couplings to SM bosons and fermions are also discussed.

Summary:

Posters / 102

Study of doubly heavy baryon decays in light-front approach

Wei Wang¹; Fu-Sheng Yu²; Zhen-Xing Zhao¹

¹ *Shanghai Jiao Tong University*

² *Lanzhou University*

In this work, we study the transition processes of doubly heavy baryons $\Xi_{cc}^{++}, \Xi_{cc}^+, \Omega_{cc}^+, \Xi_{bc}^+, \Xi_{bc}^0, \Omega_{bc}^0$ and Ω_{bb}^- . At the quark level these transitions are depicted by the weak decays of $c \rightarrow d/s$ or $b \rightarrow u$ and the other two spectator quarks are viewed as a scalar diquark. We first derived the form factors of these transitions in light-front approach and then apply them to predict the semi-leptonic and non-leptonic decay widths of doubly heavy baryons. We find that some decay channels are sizable and are hopeful to be detected at the LHC experiment.

Summary:

Posters / 159

Study of the Material within the Run II ATLAS Inner Detector

Valentina Cairo¹

¹ *Universita della Calabria (IT)*

Corresponding Author(s): valentina.maria.cairo@cern.ch

The material in the ATLAS Inner Detector (ID) is studied with several methods, using a sample of $\sqrt{s}=13$ TeV pp collisions collected in 2015 during Run II of the LHC. The material within the innermost barrel regions of the

ID is studied using reconstructed secondary vertices from hadronic interactions and photon conversions. The layout of the cables, cooling pipes and support structures (services) associated with the Pixel detector, in the region in front of the Silicon Microstrip detector (SCT), was modified in 2014. The material in this region was studied by measuring the efficiency with which tracks reconstructed only in the Pixel detector can be matched to tracks reconstructed in the full ID (track extension efficiency). The results of these studies are presented together with a comparison to previous measurements and a description of their impact on physics analyses and Monte Carlo simulation.

Summary:

Posters / 158

Studying $WV\gamma$ production in proton-proton collisions at $\sqrt{s} = 8$ TeV with the ATLAS experiment

Julia Isabell Djuvsland¹

¹ *Ruprecht-Karls-Universitaet Heidelberg (DE)*

Corresponding Author(s): julia.isabell.hofmann@cern.ch

Quartic gauge couplings are tested by this study of the production of $WV\gamma$ events (where $V = W$ or Z) in 20.2 fb⁻¹ of proton-proton collisions at a centre-of-mass energy of $\sqrt{s} = 8$ TeV recorded with the ATLAS detector. The fully-leptonic final state of $WW\gamma$ events containing an electron, a muon and a photon is analysed as well as semi-leptonic final states of $WV\gamma$ production containing an electron or a muon, two jets and a photon. For all final states two different fiducial regions are defined: one yielding the best sensitivity to the production cross section of the process and one optimised for the detection of new physical phenomena. In the former region, the $WV\gamma$ production cross section is computed using the fully-leptonic final state. In addition, upper limits on the production cross section are derived in both regions for all final states individually and for the combination of the semi-leptonic final states. The results obtained in the new physics phase space are combined for the interpretation in the context of anomalous quartic gauge couplings using an effective field theory.

Summary:

Parallel Performance / 185

Tau-tagging in ATLAS and CMS

Corresponding Author(s): martin.flechl@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 214

Tests of of Lepton Flavour Universality with semileptonic decays at LHCb

Corresponding Author(s): federico.betti@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 215

Tests of of Lepton Flavour Universality with $b \rightarrow sll$ transitions at LHCb

Corresponding Author(s): guido.andreassi@cern.ch

14' Talk +2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Special Plenary Session / 71

Tevatron Legacy

Corresponding Author(s): denisovd@fnal.gov

Summary:

Posters / 164

The ATLAS Run-2 Trigger Menu for higher luminosities: Design, Performance and Operational Aspects

Javier Montejo Berlingen¹

¹ CERN

Corresponding Author(s): javier.montejo.berlingen@cern.ch

The LHC, at design capacity, has a bunch-crossing rate of 40 MHz whereas the ATLAS experiment has an average recording rate of about 1 kHz. To reduce the rate of events, but maintain high selection efficiency for rare events such as physics signals beyond the Standard Model, a two-level trigger system is used. Events are selected based on physics signatures such as presence of energetic leptons, photons, jets or large missing energy. Despite the limited time available for processing collision events the trigger system is able to exploit topological information, as well as using multivariate methods. In total, the ATLAS trigger systems consists of thousands of different individual triggers.

The ATLAS trigger menu specifies which triggers are used during data taking and how much rate a given trigger is allocated. This menu reflects not only the physics goals of the collaboration but also takes into consideration the instantaneous luminosity of the LHC and the design limits of the ATLAS detector and offline processing farm. For 2017 data taking, the trigger selections and menus have been improved to handle expected higher luminosities of up to $2.0 \times 10^{34} \text{cm}^{-2} \text{s}^{-1}$ and to ensure robustness in the presence of multiple interactions per bunch crossing.

We describe the criteria for designing the ATLAS trigger menu used for the LHC Run 2 period. Furthermore, we discuss how the trigger menu is deployed for data taking, through different phases: validation before deployment, decisions on prescale values for different triggers (ahead of running, or live in case of sudden rate changes), and monitoring during data taking itself.

Summary:

Parallel Upgrade / 287

The ATLAS tracker for the HL-LHC

Corresponding Author(s): jdopke@cern.ch

Summary:

Plenary - Searches / 31

The BSM landscape, 2017

Corresponding Author(s): hdkim@phya.snu.ac.kr

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Parallel Upgrade / 288

The CMS HGCAL detector for HL-LHC upgrade

Corresponding Author(s): arabella.martelli@cern.ch

Summary:

Parallel Upgrade / 295

The Electron-Ion Collider

Corresponding Author(s): bowen@phys.columbia.edu

Summary:

Opening Plenary / 60

The Large Hadron Collider: status and plans

Corresponding Author(s): roberto.losito@cern.ch

Parallel Performance / 182

The Luminosity measurements

Corresponding Author(s): martino.gagliardi@cern.ch

20' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 169

The PandaX-IV Dark Matter Experiment

Xiangxiang Ren¹

¹ *Shanghai Jiao Tong university*

Corresponding Author(s): phy.fenghuang@gmail.com

The PandaX-IV (Particle AND Astrophysical Xenon phase IV) project is a dark matter direct detection experiment with dual-phase xenon located in the China JinPing Underground Laboratory phase-II (CJPL-II). As the result of 120kg PandaX-I has been released in May 2015 and the 500kg PandaX-II will stop data taking in 2018, the upgraded experiment, PandaX-IV, will contain 4 tons of xenon in the sensitive volume and we hope it will set the more stringent limit for WIMP.

This poster will present the design of PandaX-IV experiment.

Summary:

Posters / 2

The Particle nature of Mini Black Hole at LHC

M. Ayub Faridi¹; Abeeha Batool²; Sadia Nazir¹

¹ *CHEP*

² *CHEP, University of the Punjab*

Corresponding Author(s): a.btool512@gmail.com, ayubfaridi.chep@pu.edu.pk

We discuss quantum mechanical directions where a mini black hole at LHC behaves like a “particle”, even if with a unique property: its linear size grows with the energy. The curved dynamics is explained in terms of a particle moving in gravitational potential. The particle turning-points match the radius of the inner and outer horizons of a Reissner–Nordström black hole. Further we compute a particular form of the wave function and determine the energy spectrum in present talk.

Summary:

Parallel TOP / 72

The combination of NNLO QCD and NLO EW corrections in top pair production

Corresponding Author(s): davide.pagani@tum.de

15' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel EWK / 245

The global electroweak fit: precision constraints at present and future colliders

Corresponding Author(s): jorge.deblasmateo@roma1.infn.it

We review the status of the global electroweak fit in the Standard Model (SM), including the latest theoretical and experimental updates, and compute limits on general new physics scenarios. These are compared and combined with the bounds obtained using Higgs boson observables measured at the LHC. We also present the projection of the fit with the improvements expected at future e^+e^- colliders. All the results have been obtained using the HEPfit code.

Summary:

Parallel Heavy Ions / 335

The initial stages of heavy ion collisions and the nuclear modification of the gluon densities

Corresponding Author(s): huasheng.shao@cern.ch

15' Talk and 5' Discussion

Parallel Upgrade / 290

The lifetime frontier (MilleQAN and MATHUSLA)

Corresponding Author(s): lubatti@u.washington.edu

Summary:

Posters / 95

The production of additional bosons and the impact on Higgs boson physics

Yaquan Fang¹ ; Mukesh Kumar² ; Maosen Zhou¹ ; Yu Zhang¹ ; Alan Stanley Cornell² ; Stefan Erich Von Buddenbrock² ; Xifeng Ruan² ; Bruce Mellado Garcia³

¹ *Chinese Academy of Sciences (CN)*

² *University of the Witwatersrand (ZA)*

³ *University of the Witwatersrand*

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In Refs. arXiv:1506.0061 and arXiv:1606.0167 the compatibility of LHC data taken until 2012 with a heavy scalar with a mass around 270 GeV have been discussed. The features of the data and the phenomenological framework studied there are reviewed. A number of predictions are made, including the anomalous production of multiple leptons. The decay of this heavy scalar includes the Higgs boson. The impact on a number of observables related to the measurement of the signal strengths of the Higgs boson at the LHC is discussed.

Summary:

Parallel QCD / 236

The xFitter project

Corresponding Author(s): glazov@mail.desy.de

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Heavy Ions / 21

Theoretical Progress in Heavy-ion Physics at LHC

Corresponding Author(s): xnwang@lbl.gov

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Top / 46

Theoretical aspects of the study of top quark properties

Corresponding Author(s): cenzhang@bnl.gov

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Searches / 36

Theoretical implications of DM constraints from the LHC and (in)direct searches

Corresponding Author(s): ulrich.haisch@physics.ox.ac.uk, ulrich.haisch@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - Higgs / 11

Theoretical implications of our current understanding of the Higgs boson, and future prospects

Corresponding Author(s): ianlow.nu@gmail.com, ilow@northwestern.edu

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Heavy Flavors / 41

Theoretical implications of recent heavy flavour measurements at the LHC

Corresponding Author(s): monika.blanke@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - EWK / 26

Theoretical progress in the study of EW phenomena at the LHC

Jonas Lindert^{None}

Corresponding Author(s): lindert@physik.uzh.ch, lindert@mppmu.mpg.de

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Flavors / 203

Theory of heavy meson mixing & CKM-SM

Corresponding Author(s): marcella.bona@cern.ch

20' Talk +5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Heavy Ions / 336

Theory status of quarkonium production in heavy-ion collisions

Corresponding Author(s): zhuangpf@mail.tsinghua.edu.cn

15' Talk and 5' Discussion

Closing Plenary / 68

Theory vision

Corresponding Author(s): hitoshi@berkeley.edu

Parallel Searches / 114

Third generation squarks (hadronic) with ATLAS

Corresponding Author(s): martin.tripiana@cern.ch

Summary:

Parallel Searches / 115

Third generation squarks (leptonic) with ATLAS

Corresponding Author(s): keisuke.yoshihara@cern.ch

Summary:

Parallel Searches / 113

Third generation squarks with CMS

Corresponding Author(s): caroline.collard@cern.ch

Summary:

Plenary - Top / 47

Top production properties at LHC

Corresponding Author(s): thomas.muller@cern.ch, muellert@physik.uni-muenchen.de, mullerth@ekp.physik.uni-karlsruhe.de

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - Top / 48

Top properties

Corresponding Author(s): kerim.suruliz@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 83

Top quark mass: recent theory developments

Corresponding Author(s): moritz.preisser@univie.ac.at

15' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 186

Tracking and alignment performance and prospects at ATLAS and CMS in Run 2

Corresponding Author(s): heather.gray@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 187

Tracking and vertex reconstruction at LHCb for Run2

Corresponding Author(s): hang.yin@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel Performance / 189

Tracking performance in high multiplicities environment at ALICE

Corresponding Author(s): drohr@jwdt.org

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 259

Transverse momentum resummation for t-channel single top quark production at the LHC

Author(s): Bin Yan¹

Co-author(s): Qing-Hong Cao²; Peng Sun³; C.-P. Yuan³; Feng Yuan⁴

¹ *Peking university*

² *Peking University*

³ *Michigan State University*

⁴ *Lawrence Berkeley National Laboratory*

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We study the soft gluon radiation effects for the t -channel single top quark production at the LHC. By applying the transverse momentum dependent factorization formalism, the large logarithms about the small total transverse momentum (q_{\perp}) of the single-top plus one-jet final state system, are resummed to all orders in the expansion of the strong interaction coupling at the accuracy of Next-to-Leading Logarithm(NLL). We compare the singular behavior of resummation calculation to fixed order prediction at the small q_{\perp} region, and find a perfect agreement. The phenomenological importance of the resummation effect at the LHC is also demonstrated.

Summary:

Plenary - Searches / 35

Unconventional signatures

Corresponding Author(s): javier.montejo.berlingen@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 166

Upgrade of the ATLAS hadronic Tile calorimeter for the High luminosity LHC

Michaela Mlynarikova¹

¹ Charles University (CZ)

Corresponding Author(s): michaela.mlynarikova@cern.ch

The Tile Calorimeter (TileCal) is the hadronic calorimeter covering the central region of the ATLAS detector at the LHC. It is a sampling calorimeter consisting of alternating thin steel plates and scintillating tiles. Wavelength shifting fibers coupled to the tiles collect the produced light and are read out by photomultiplier tubes. Currently, an analog sum of the processed signal of several photomultipliers serves as input to the first level of trigger. Photomultiplier signals are then digitized and stored on detector and are only transferred off detector once the first trigger acceptance has been confirmed.

The Large Hadron Collider (LHC) has envisaged a series of upgrades towards a High Luminosity LHC (HL-LHC) delivering five times the LHC nominal instantaneous luminosity. The ATLAS Phase II upgrade, in 2024, will accommodate the detector and data acquisition system for the HL-LHC. In particular, TileCal will undergo a major replacement of its on- and off-detector electronics. All signals will be digitized and then transferred directly to the off-detector electronics, where the signals will be reconstructed, stored, and sent to the first level of trigger at a rate of 40 MHz. This will provide better precision of the calorimeter signals used by the trigger system and will allow the development of more complex trigger algorithms. Changes to the electronics will also contribute to the reliability and redundancy of the system.

Three different front-end options are presently being investigated for the upgrade. Results of extensive laboratory tests and with beams of the three options will be presented, as well as the latest results on the development of the power distribution and the off-detector electronics.

Summary:

Parallel EWK / 249

VBF and VBS measurements in ATLAS

Corresponding Author(s): narei.lorenzo.martinez@cern.ch

Parallel EWK / 250

VBF and VBS measurements in CMS

Corresponding Author(s): p.pigard@cern.ch

Plenary - Searches / 39

VLQs and complex signatures

Corresponding Author(s): andrew.ivanov@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Plenary - EWK / 27

Vec. boson production (+jets)

Corresponding Author(s): william.james.barter@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel QCD / 235

Very forward measurements at the LHC

Corresponding Author(s): mirko.berretti@cern.ch

15' Talk and 2' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Plenary - EWK / 29

W mass

Corresponding Author(s): maarten.boonekamp@cern.ch

20' Talk and 4' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Opening Plenary / 58

Welcome remarks

Posters / 180

[POSTER] Anisotropic flow of identified particles in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

Ya Zhu¹

¹ CCNU

Corresponding Author(s): double10a6@gmail.com

Anisotropic flow plays a critical role in understanding the properties of the quark-gluon plasma. In this poster we present the

elliptic and triangular flow of identified particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV recorded by the ALICE detector. The measurements are presented for a wide range of particle transverse momenta. The results are compared to the ones in Pb-Pb collisions at lower energy.

Summary:

Parallel Performance / 188

b-jet tagging in ATLAS and CMS

Corresponding Author(s): sluca@ifca.unican.es, luca.scodellaro@cern.ch

15' Talk and 5' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 75

boosted production in ATLAS and CMS

Corresponding Author(s): romano@bo.infn.it, marino.romano@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 176

miss

Yi Yang¹ ; Wenchang Xiang²

¹ *Guizhou Normal University*

² *University of Colorado Boulder*

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Based on the framework of color glass condensate, we studied the hadron multiplicity distribution at the LHC energies, The full next-to-leading order Balitsky-Kovchegov(BK) equation is solved numerically, which obtain the NLO unintegrated gluon distribution (UGD) function in the coordinate space. We also extend the parton distribution function and the fragmentation function to NLO. A full NLO CGC particle production model is established in this study. When we compare the model calculations with charged hadron multiplicity experimental data from LHC, the results show the full NLO CGC model can describe the data very well.

Summary:

Parallel TOP / 90

top decay properties in ATLAS and CMS

Corresponding Author(s): prolay.kumar.mal@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 84

top mass in ATLAS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 85

top mass in CMS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 89

top production properties in ATLAS and CMS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 82

top properties and mass at the Tevatron

Corresponding Author(s): gregorio.bernardi@cern.ch

12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 73

tt cross sections in ATLAS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 74

tt cross sections in CMS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 88

tt+X production in ATLAS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Parallel TOP / 87

tt+X production in CMS

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12' Talk and 3' Discussion (speakers are kindly requested to keep the allocated time strictly)

Summary:

Posters / 155

Measurements of integrated and differential cross sections for isolated photon pair production in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector

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A measurement of the production cross section for two isolated photons in proton-proton collisions at a centre-of-mass energy of $\sqrt{s} = 8$ TeV is presented. The results are based on an integrated luminosity of 20.24 fb^{-1} recorded by the ATLAS detector at the Large Hadron Collider. The measurement considers photons with pseudorapidities satisfying $|\eta_\gamma| < 1.37$ or $1.56 < |\eta_\gamma| < 2.37$ and transverse energies of respectively $E_{T,1} > 40$ GeV and $E_{T,2} > 30$ GeV for the highest and second highest E_T photon produced in the interaction. The background due to hadronic jets and electrons is subtracted using data-driven techniques. The fiducial cross sections are corrected for detector effects and measured differentially as a function of six kinematic observables. The data are compared to fixed-order QCD calculations at 16 next-to-leading order (NLO) and next-to-next-to-leading-order (NNLO) accuracy as well as NLO computations including resummation of initial-state gluon radiation at next-to-next-to-leading-logarithm or matched to a parton shower.

Summary: