7th Edition of the Large Hadron Collider Physics Conference

Report of Contributions

https://indico.cern.ch/e/687651
Explore the lifetime frontier with MATHUSLA

The observation of neutral long-lived particles at the LHC would reveal physics beyond the Standard Model and could account for the many open issues in our understanding of our universe. Long-lived particle signatures are well motivated and can appear in many theoretical constructs that address the Hierarchy Problem, Dark Matter, Neutrino Masses and the Baryon Asymmetry of the Universe.

With the current experiments at the particle accelerators, no search strategy will be able to observe the decay of neutral long-lived particles with masses above $\sim$GeV and lifetimes at the limit set by Big Bang Nucleosynthesis (BBN), $c\tau \sim 10^7 - 10^8$ m.

The MATHUSLA detector concept (MAssive Timing Hodoscope for Ultra-Stable neutral pArticles) will be presented. It can be implemented on the surface above ATLAS or CMS detectors in time for the high-luminosity LHC operations, to search for neutral long-lived particles with lifetimes up to the BBN limit. The large area of the detector allows MATHUSLA to make important contributions also to cosmic-ray physics. We will also report on the analysis of data collected by the test stand installed on the surface above the ATLAS detector, the on-going background studies, and plans for the MATHUSLA detector.

**Presenter:** RODRIGUEZ CAHUANTZI, Mario (Autonomous University of Puebla (MX))

**Session Classification:** Poster session

**Track Classification:** SUSY
New Physics in Vector Boson Scattering at the LHC

After the discovery of a light Higgs boson, the scattering of electroweak vector bosons (VBS) is even more an eminent search channel for new physics due to the intricate cancellations between gauge and Higgs amplitudes. We will discuss the most general model-independent parameterization for new physics in terms of Standard Model Effective Field Theory (SMEFT), and detail the limitations of this approach regarding validity, applicability, and detectability of operator coefficients. Limits from unitarity of amplitudes and possible unitarization prescriptions will be shown. Beyond the EFT, we will discuss Simplified Models in terms of generic resonances that can show up in the VBS channels. Furthermore, we will discuss new physics in longitudinal as well as transversal vector bosons, and means how to disentangle them.

Primary author: REUTER, Jürgen (DESY Hamburg, Germany)
Co-authors: BRAß, Simon (Universität Siegen); KILIAN, Wolfgang (University of Siegen)
Presenter: REUTER, Jürgen (DESY Hamburg, Germany)
Session Classification: Poster session
Track Classification: Electroweak
Exotic and Conventional Quarkonium Physics
Prospects at Belle II

The Belle II experiment at the SuperKEKB energy-asymmetric $e^+e^-$ collider is a substantial upgrade of the B factory facility at KEK in Tsukuba, Japan. It aims to record a factor of 50 times more data than its predecessor. The experiment completed a commissioning run in 2018, and began full operation in early 2019. Belle II is uniquely capable of studying the so-called "XYZ" particles: heavy exotic hadrons consisting of more than three quarks. First discovered by Belle, these now number in the dozens, and represent the emergence of a new category within quantum chromodynamics. This talk will present the prospects of Belle II to explore both exotic and conventional quarkonium physics.

**Primary author:** PERUZZI, Ida (Laboratori Nazionali di Frascati dell’INFN)

**Presenter:** PERUZZI, Ida (Laboratori Nazionali di Frascati dell’INFN)

**Track Classification:** QCD
MoEDAL - Expanding the LHC’s Discovery Frontier

MoEDAL (Monopole and Exotics Detector at the LHC) is the 7th experiment, specifically dedicated to investigating beyond the Standard Model scenarios by searching for highly ionizing particles, such as magnetic monopoles or massive pseudo-stable charged particles and multiply electrically charged particles as messengers of new physics. Sharing the same interaction point as the LHCb experiment, MoEDAL is complementary to the larger ATLAS and CMS experiments, thereby expanding the discovery reach of the LHC. This largely passive detector is comprised of the following subdetectors: A large array of NTD (Nuclear Track Detector) stacks, a magnetic trapping detector (designed to trap both electrically and magnetically charged highly ionizing particles), and a TimePix chip array that monitors particle backgrounds. MAPP (MoEDAL Apparatus for Penetrating Particles), a new MoEDAL subdetector, is currently being prototyped. The aim of MAPP is to enable MoEDAL to search for fractionally charged particles as well as long-lived neutrals. The goal of this poster is to summarize the growing physics programmes of MoEDAL and MAPP, introduce the detection methods used, and present MoEDAL’s latest results.

Primary author: Mr STAELENS, Michael (University of Alberta)
Presenter: Mr STAELENS, Michael (University of Alberta)
Session Classification: Poster session
Upgrade of the ATLAS Thin Gap Chamber Electronics for HL-LHC

The High-Luminosity LHC (HL-LHC) is planned to start the operation in 2026 with an instantaneous luminosity of $7.5 \times 10^{34}$ cm$^{-2}$s$^{-1}$. In order to cope with the event rate higher than that of LHC, the trigger and readout electronics of ATLAS Thin Gap Chamber (TGC) will need to be replaced. All hit data will be transferred from the frontend to the backend boards and exploited by an advanced first-level muon trigger based on a fast tracking. First prototype of the frontend board has been developed with full functions required for HL-LHC including the data transfer of 256 channels with a 16 Gbps bandwidth and the control of the discriminator threshold. They have been demonstrated at the CERN SPS beam facility. The rate of single event upset in Kintex-7 FPGA integrated on the prototype board was measured in the ATLAS detector area, and automatic error correction was demonstrated. Fast tracking algorithm has been emulated in the data taken by ATLAS. The result indicates that the advanced trigger based on fast tracking reduces the event rate by 30% while increasing the efficiency by a few percent. Test firmware was developed and the performance of fast tracking was evaluated with Virtex UltraScale+ FPGA evaluation kit. These studies provide essential ingredients in the development of ATLAS TGC electronics for HL-LHC.

**Primary author:** ATLAS MUON, Collaboration

**Presenters:** ATLAS MUON, Collaboration; ASADA, Haruka (Nagoya University (JP))

**Session Classification:** Poster session

**Track Classification:** Upgrade
The role of form factors in a model for the J/psi→ Pi Pi Pi decay.

The so called rho-pi puzzle has defied every theoretical approach, and it consists in understanding why higher-mass intermediate states are suppressed in favor of rho-pi dynamics. The study of known decays of the psi meson can shed light in solving this puzzle. In several sources it has been introduced the use of a form factor for the meson meson meson vertices due to the internal quark-gluon structure of the hadrons, and it is known that form factors play an important role in physical phenomena such as pion-pion scattering. It is also common to use a form factor for the s-channel monopole.

In this work we study the impact of form factors in the J/psi → pi pi pi branching ratio, considering form factors for both monopole and meson meson meson (mmm) vertex. We propose a model for the description of the J/psi-V-P vertex inspired in resonance chiral theory, assuming it can be applied in the representation of the V-P-P vertex. For our model, an unknown coupling constant needs to be determined. This decay has been already studied in the literature, so comparison can be done between our work and those models.

Primary authors:  Mr FLORES-OCAMPO, Fidel E. (CICFIM-UANL); Dr FLORES-BAEZ, Francisco V. (FCFM-UANL); Dr MORONES-IBARRA, Rubén (FCFM-UANL)

Presenter:  Mr FLORES-OCAMPO, Fidel E. (CICFIM-UANL)

Session Classification: Poster session

Track Classification: QCD
Searching for axion-like particles in light-by-light scattering at the Large Hadron Collider

The existence of pseudoscalars weakly coupled to particles from the Standard Model of particle physics, known as axion-like particles (ALP), would induce anomalous scattering of light-by-light. Searching for these particles relying only on their coupling to the electromagnetic field is challenging. This process can be probed at the Large Hadron Collider (LHC) in production of photon pairs in proton-proton where the protons remain intact after the collision and have lost a fraction of their original longitudinal momentum due to coherent photon exchanges ($pp \rightarrow p \gamma \gamma p$), and are tagged using dedicated forward proton spectrometers installed at the LHC. We estimate the expected sensitivity on the ALP-photon coupling for a wide range of masses. We show that the proposed search is competitive and complementary to other collider bounds for masses above 600 GeV, especially for resonant ALP production between 600 GeV and 2 TeV.

**Primary author:** BALDENEGRO BARRERA, Cristian (The University of Kansas (US))

**Presenter:** BALDENEGRO BARRERA, Cristian (The University of Kansas (US))

**Session Classification:** Poster session

**Track Classification:** Electroweak
Low-energy limit of SMEFT applied to tau to pi pi nu_tau decays

We perform an effective field theory analysis of the $\tau^- \rightarrow \pi^- \pi^0 \nu_\tau$ decays, that includes the most general interactions between Standard Model fields up to dimension six, assuming left-handed neutrinos. We constrain as much as possible the necessary Standard Model hadronic input using chiral symmetry, dispersion relations, data and asymptotic QCD properties. As a result, we set precise (competitive with low-energy and LHC measurements) bounds on (non-standard) charged current tensor interactions, finding a very small preference for their presence, according to Belle data. Belle-II near future measurements can thus be very useful in either confirming or further restricting new physics tensor current contributions to these decays. For this, the spectrum in the di-pion invariant mass turns out to be particularly promising. Distributions in the angle defined by the $\tau^-$ and $\pi^-$ momenta can also be helpful if measured with less than 10% accuracy, both for non-standard scalar and tensor interactions.

**Primary authors:** Mr MIRANDA, Alejandro (Cinvestav); Dr ROIG, Pablo (Cinvestav)

**Presenter:** Mr MIRANDA, Alejandro (Cinvestav)

**Session Classification:** Poster session

**Track Classification:** Electroweak
Low-energy limit of SMEFT applied to the τ−→(Kπ)−ντ decays

We analyze the τ−→(Kπ)−ντ decays within an effective field theory description of heavy new physics (NP) modifying the SM left-handed weak charged current and include refined SM input (with controlled uncertainties) for the participant meson form factors exploiting chiral symmetry, dispersion relations and data. We include the leading dimension six operators and work at linear order in the effective couplings. Within this setting we:

i) confirm that it is impossible to understand the BaBar anomaly in the CP asymmetry measurement (we find an upper bound for the NP contribution slightly larger than in Phys. Rev. Lett. 120 (2018) no.14, 141803, but still irrelevant compared to the experimental uncertainty by four orders of magnitude approximately);

ii) first show that the anomalous bump present in the published Belle data for the KSπ− invariant mass distribution close to threshold cannot be due to heavy NP;

iii) first bind the heavy NP effective couplings using τ−→(Kπ)−ντ decays and show that they are competitive with those found in hyperon semileptonic decays. Although they are not at the level found in semileptonic Kaon decays for the non-standard scalar contributions, they are competitive with Kaon and LHC data for the NP tensor interactions.

We also compare the SM predictions with the possible deviations caused by NP in a couple of Dalitz plot distributions, in the forward-backward asymmetry and in the di-meson invariant mass distribution and discuss the most interesting measurements to be performed at Belle-II using these decays data.

Primary authors:  Mr RENDÓN, Javier (Cinvestav); Dr ROIG, Pablo (Cinvestav); Dr TOLEDO, Genaro (IF-UNAM)

Presenter:  Mr RENDÓN, Javier (Cinvestav)

Session Classification:  Poster session

Track Classification:  Electroweak
h->2 gamma and h->Z gamma decays in the SM EFT

I will present the calculation of the h->2 gamma and h->Z gamma decays in the SM EFT at the 1-loop level. I will discuss the calculational setup including derivation of interaction vertices in physical field basis, choice of gauge fixing conditions and choice of the renormalization scheme. The final results for the Br(h->2 gamma) and Br(h->Z gamma) are given as compact semi-analytical expressions, which could be used to obtain constraints on the Wilson coefficients of the dimension-6 SMEFT operators.

Primary author: ROSIEK, Janusz (University of Warsaw (PL))
Presenter: ROSIEK, Janusz (University of Warsaw (PL))
Session Classification: Poster session

Track Classification: Electroweak
Production of $W$ bosons in $pp$ collisions at $\sqrt{s} = 5.02$ TeV with the ATLAS detector

Poster abstract: Precision measurements of electroweak boson production in $pp$ collisions are considered benchmark tests of the Standard Model. In particular, they provide verification for predictions of the electroweak theory and quantum chromodynamics (QCD). The rapidity of electroweak bosons produced in $pp$ collisions is strongly correlated with the initial quark dynamics. Therefore, these measurements can provide constraints on parton distribution functions (PDFs) of the proton. This study presents the first measurement of $W$ boson production in $pp$ collisions at $\sqrt{s} = 5.02$ TeV using data collected by the ATLAS experiment in 2015. Fiducial cross-sections for $W^+$ and $W^-$ boson production are measured in leptonic decay channels. The cross-sections are measured inclusively and differentially in the decay lepton pseudorapidity. In addition, a measurement of the lepton charge asymmetry is presented. The measured cross-sections and charge asymmetry are compared to predictions calculated at NNLO in QCD using several recent sets of PDFs.

Primary author: ATLAS, Collaboration (CERN)
Presenter: ATLAS, Collaboration (CERN)
Session Classification: Poster session
Track Classification: Heavy Ions
Evidence for the production of three massive vector bosons with the ATLAS detector

A search for the production of three massive vector bosons in $pp$ collisions is performed using data at $\sqrt{s} = 13$ TeV recorded with the ATLAS detector at the Large Hadron Collider in the years 2015–2017, corresponding to an integrated luminosity of 79.8 fb$^{-1}$. Events with two same-sign leptons $\ell$ (electrons or muons) and at least two reconstructed jets are selected to search for $WWW \rightarrow \ell\ell\nu\nu q\bar{q}$. Events with three leptons without any same-flavour opposite-sign lepton pairs are used to search for $WWW \rightarrow \ell\ell\nu\nu$, while events with three leptons and at least one such lepton pair and one or more reconstructed jets are used to search for $WWZ \rightarrow \ell\nuqqll$. Finally, events with four leptons are analysed to search for $WWZ \rightarrow \ell\ell\nu\nu$ and $WZZ \rightarrow q\bar{q}llll$. Evidence for the joint production of three massive vector bosons in $pp$ collisions is observed with a significance of 4.0 standard deviations, where the expectation is 3.1.

Primary author: ATLAS, Collaboration (CERN)

Presenters: ATLAS, Collaboration (CERN); CRISTINZIANI, Markus (University of Bonn (DE))

Session Classification: Poster session

Track Classification: Electroweak
Search for gluinos and squarks in final states with jets and missing transverse momentum at $\sqrt{s} = 13$ TeV with the ATLAS detector

Supersymmetry is one of the most promising theories which extend the Standard Model in order to solve the dark matter and the hierarchy problem. The squark and gluinos are one of primary targets in supersymmetry searches, as the pair production has large cross section at the LHC via the strong interaction. This poster presents recent ATLAS results from searches for gluinos and squarks in final states with jets and missing transverse momentum using the full Run2 dataset, corresponding to 139 fb$^{-1}$.

**Primary author:** ATLAS, Collaboration (CERN)

**Presenters:** ATLAS, Collaboration (CERN); UNO, Kenta (University of Tokyo (JP))

**Session Classification:** Poster session

**Track Classification:** SUSY
Search for dark-photons decaying to lepton-jets with the ATLAS detector at LHC

Several new physics models predict the existence of neutral particles with macroscopic life-times that decay to pairs of leptons and light hadrons with a jet-like structure (lepton-jets). These particles, decaying outside of the interaction region, will give rise to striking signatures in the detectors at the LHC. These can be detected through numerous unconventional signatures: long time-of-flight, late calorimetric energy deposits or displaced vertices. The most recent ATLAS results using data collected in proton-proton collisions at $\sqrt{s}=13\text{TeV}$ are presented. Prospects for the search for these particles with the ATLAS detector upgrade at HL-LHC are also given.

Primary author: ATLAS, Collaboration (CERN)

Presenters: ATLAS, Collaboration (CERN); SEBASTIANI, Cristiano (INFN Roma and Sapienza Universita’ di Roma (IT))

Session Classification: Poster session

Track Classification: Exotics
Reconstruction and identification of high-pT muons in $\sqrt{s} = 13$ TeV proton-proton collisions with the ATLAS detector

The ability to reconstruct almost-straight tracks with good momentum resolution is closely tied to maintaining a good understanding of the ATLAS tracking detectors’ alignment and the related uncertainties. Moreover, an optimal selection of muon candidates with TeV-scale transverse momentum (pT) is a critical factor in determining the sensitivity of analyses looking for new high-mass resonances, such as $Z'\rightarrow\mu\mu$ and $W'\rightarrow\mu\nu$ searches. This work provides an overview on the muon reconstruction method used to account for the differences in position and orientation of the various detector elements, between the geometry assumed in tracking and the real detector. Further, the requirements that define the identification of high-pT muons in the full Run II ATLAS dataset are detailed, together with several innovations. Such requirements have been tuned to select muons with the best possible momentum resolution, thus ensuring that candidates fulfilling the criteria are of the highest quality. The performance of the high-pT muon reconstruction and identification is also discussed, based on the result of measurements performed in data and simulation samples corresponding to an integrated luminosity of approximately 140 fb⁻¹.

Primary author: ATLAS COLLABORATION

Presenters: ATLAS COLLABORATION; VANNICOLA, Damiano (Sapienza Universita e INFN, Roma I (IT))

Session Classification: Poster session

Track Classification: Perform. / Tools
Track-counting luminosity measurements in ATLAS

At the LHC, the number of inelastic proton-proton collisions per second is related to the luminosity. Track counting is one of the methods for luminosity measurement in the ATLAS experiment. It is done by counting the number of charged-particle tracks reconstructed in the inner detector in unbiased triggers, where the number of tracks scales with the number of interactions. Therefore, as long as the performance of track reconstruction and selection are independent of the luminosity and time, the average number of tracks per event can be used to measure the luminosity. A new track selection, which is less sensitive to changes in the inner detector conditions and shows a more stable performance over a large luminosity range, was introduced in 2017. Results from 2017 and 2018 data have shown a good agreement between track counting and other algorithms, including LUCID which is the dedicated online luminometer of the ATLAS detector.

Primary author: ATLAS COLLABORATION

Presenters: ATLAS COLLABORATION; PASUWAN, Patrawan (Stockholm University (SE))

Session Classification: Poster session

Track Classification: Perform. / Tools
Study of $\Lambda$, $\Omega$ and $\Xi$ production on pp collisions at LHC energies in the SPM framework.

QGP an exotic state of matter is created on heavy Ion collisions (nuclear collisions), recent results show some signals that indicate a phase transition in pp collisions, it’s well known that in the presence of QGP the production of baryons and mesons shows a clear modification, we study this observable as a signal of a deconfinement in the system, in concrete, the production of multi-strange baryons, by using the String Percolation Model.

Primary authors: CONTRERAS, Alejandro; BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX))

Presenter: CONTRERAS, Alejandro

Session Classification: Poster session

Track Classification: QCD
Tracking performance with the HL-LHC ATLAS detector

The High Luminosity LHC (HL-LHC) aims to increase the LHC data-set by an order of magnitude in order to increase its potential for discoveries. The high pileup at the HL-LHC presents a highly challenging environment to particle detectors. To cope with this, the current Inner Detector of the ATLAS experiment will be replaced with a new all-silicon Inner Tracker (ITk). In this poster the expected tracking performance of this new subdetector is presented and impact of the tracking performance on physics object reconstruction is shown. These studies were done for two options of the pixel sensor pitch.

Primary author: ATLAS COLLABORATION

Presenters: ATLAS COLLABORATION; SMYKIEWICZ, Andrzej (Polish Academy of Sciences (PL))

Session Classification: Poster session

Track Classification: Perform. / Tools
Study of initial state and causal dissipative fluid expansion in pp and pPb collisions at LHC energies with percolation color sources approach

By using the string percolation framework we study the shear and bulk viscosity over entropy ratio in addition to studying the mixed effect of the two viscosities in high multiplicity events in pPb and pp collisions at the current LHC energies, where evidence on collective like effects has been found recently on data. Evidence of the formation of a strongly interacting medium similar to that obtained in nuclear collisions is shown. Moreover effects of non thermal equilibrium are shown to be significant.

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Presenter: ALVARADO GARCÍA, Jesús Ricardo (FCM)
Session Classification: Poster session
Track Classification: QCD
The ATLAS Electron and Photon Trigger Performance in 2015-2018

ATLAS electron and photon triggers covering transverse energies from 5 GeV to several TeV are essential to record signals for a wide variety of physics: from Standard Model processes to searches for new phenomena in both proton-proton and heavy ion collisions. To cope with ever-increasing luminosity and more challenging pile-up conditions at the LHC, the trigger selections needed to be optimized to control the rates and keep efficiencies high. The ATLAS electron and photon performance during 2015-2018 data-taking is presented as well as work ongoing to prepare to even higher luminosity of Run 3.

Primary author: ATLAS COLLABORATION

Presenters: ATLAS COLLABORATION; Mr BAKSHI GUPTA, Debottam (University of Texas at Arlington (US))

Session Classification: Poster session

Track Classification: Perform. / Tools
The ATLAS Hardware Track Trigger design towards first prototypes

In the High Luminosity LHC, planned to start with Run4 in 2026, the ATLAS experiment will be equipped with the Hardware Track Trigger (HTT) system, a dedicated hardware system able to reconstruct tracks in the silicon detectors with short latency. This HTT will be composed of about 700 ATCA boards, based on new technologies available on the market, like high speed links and powerful FPGAs, as well as custom-designed Associative Memories ASIC (AM), which are an evolution of those used extensively in previous experiments and in the ATLAS Fast Tracker (FTK).

The HTT is designed to cope with the expected extreme high luminosity in the so called L0—only scenario, where HTT will operate at the L0 rate (1 MHz). It will provide good quality tracks to the software High-Level-Trigger (HLT), operating as coprocessor, reducing the HLT farm size by a factor of 10, by lightening the load of the software tracking.

All ATLAS upgrade projects are designed also for an evolved, so-called "L0/L1" architecture, where part of HTT is used in a low-latency mode (L1Track), providing tracks in regions of ATLAS at a rate of up to 4MHz, with a latency of a few micro-seconds. This second phase poses very stringent requirements on the latency budget and to the dataflow rates.

All the requirements and the specifications of this system have been assessed. The design of all the components has being reviewed and validated with preliminary simulation studies. After these validations are completed, the development of the first prototypes will start. In this paper we describe the status of the design review, showing challenges and assessed specifications, towards the preparation of the first slice tests with real prototypes.

Primary author:  ATLAS COLLABORATION
Presenter:  ATLAS COLLABORATION
Session Classification:  Poster session
Track Classification:  Perform. / Tools
The ATLAS Run-2 Trigger Menu

The ATLAS experiment aims at recording about 1 kHz of physics collisions, starting with an LHC design bunch crossing rate of 40 MHz. To reduce the significant background rate while maintaining a high selection efficiency for rare physics events (such as beyond the Standard Model physics), a two-level trigger system is used.

Events are selected based on physics signatures such as the presence of energetic leptons, photons, jets or large missing energy. The trigger system exploits topological information, as well as multivariate methods to carry out the necessary physics filtering for the many analyses that are pursued by the ATLAS community. In total, the ATLAS online selection consists of around 1500 individual triggers. A Trigger Menu is the compilation of these triggers, it specifies the physics selection algorithms to be used during data taking, and the rate and bandwidth a given trigger is allocated. Trigger menus must reflect the physics goals for a given run, and also must take into consideration the instantaneous luminosity of the LHC and limitations from the ATLAS detector readout and offline processing farm. For the 2017-2018 run, the ATLAS trigger has been enhanced to be able to handle higher instantaneous luminosities and to ensure the selection robustness against higher average multiple interactions per bunch crossing.

We will describe the design criteria for the trigger menu for Run 2. We discuss several aspects of the process of planning the trigger menu, starting from how ATLAS physics goals and the need for detector performance measurements enter the menu design, and how rate, bandwidth, and CPU constraints are folded in during the compilation of the menu. We present the tools that allow us to predict and optimize the trigger rates and CPU consumption for the anticipated LHC luminosities. We outline the online system that we implemented to monitor deviations from the individual trigger target rates, and to quickly react to the changing LHC conditions and data taking scenarios. Finally, we give an overview of the 2015-2018 Trigger Menu and performance, allowing the audience to get a taste of the broad physics program that the trigger is supporting.

Primary author: ATLAS COLLABORATION
Presenter: ATLAS COLLABORATION
Session Classification: Poster session
Track Classification: Perform. / Tools
ATLAS Muon Trigger performance

Events containing muons in the final state are an important signature for many analyses being carried out at the Large Hadron Collider (LHC), including both standard model measurements and searches for new physics. To be able to study such events, it is required to have an efficient and well-understood muon trigger. The ATLAS muon trigger consists of a hardware based system (Level 1), as well as a software based reconstruction (High Level Trigger). Due to the high luminosity in Run 2, several improvements have been implemented to keep the trigger rate low, while still maintaining a high efficiency. Some examples of recent improvements include requiring coincidence of hits in the muon spectrometer and the calorimeter and optimised muon isolation. We will present an overview of how we trigger on muons, recent improvements, the performance of the muon trigger in Run-2 data and an outlook for the improvements planned for run-3.

Primary author: ATLAS COLLABORATION
Presenters: ATLAS COLLABORATION; HAYES, Robin (University of British Columbia (CA))
Session Classification: Poster session
Track Classification: Perform. / Tools
Performance of the ATLAS tau-lepton trigger at the LHC in Run 2.

The ATLAS experiment has a rich physics program of Standard Model measurements and searches for physics Beyond the Standard Model involving tau leptons. Most of these analyses depend on an efficient tau-lepton trigger that can cope with the overwhelming background from multi-jet events produced in proton-proton collisions at the Large Hadron Collider. The ATLAS trigger system is composed of two stages. At Level-1, tau leptons are reconstructed as energy deposits in neighbouring towers of calorimeter cells. The High Level Trigger (HLT) exploits the full calorimeter granularity as well as inner-detector tracks, and runs reconstruction and identification algorithms similar to those used in the offline reconstruction. The performance of the tau-lepton trigger in ATLAS Run-2 data will be discussed, and trigger efficiencies measured with a tag-and-probe method will be presented. An emphasis will be made on the improved HLT algorithms deployed in 2018 and mentioned below. The association of tracks to the energy deposit in the calorimeter was tightened to reduce the contamination from fake tracks at high pileup. An energy calibration based on a Boosted Regression Tree with improved energy resolution has replaced the simpler calibration based on pileup subtraction and calorimeter response correction. An identification algorithm based on a Recurrent Neural Network was also deployed, which provides increased jet rejection compared to the previously-used Boosted Decision Tree identification algorithm.

Primary author: ATLAS COLLABORATION

Presenters: ATLAS COLLABORATION; SHIMOGAMA, Yoshihiro (Waseda University (JP))

Session Classification: Poster session

Track Classification: Perform. / Tools
The track-based alignment of the ALFA Roman Pot detectors of the ATLAS experiment.

ALFA detector is part of the ATLAS Roman Pot detector dedicated to measure protons scattered at very small angles. ALFA aims to study elastic and diffractive events in special runs with reduced luminosity and optimized beam optics. Precision of the measurement depends on the correct positioning of the ALFA detector with respect to the actual beam position. For this purpose track-based procedure is used which utilises tracks of beam halo and elastic protons collected during physics data taking. This poster presents results of fast and robust alignment of ALFA detectors during LHC Run 2. The alignment constants are used in analysis of diffractive events and also serve as preliminary values in elastic analysis. Precise measurements of the elastic cross sections required dedicated more precise measurement.

**Primary author:** ATLAS COLLABORATION  
**Presenter:** ATLAS COLLABORATION  
**Session Classification:** Poster session  
**Track Classification:** Perform. / Tools
A study of the proton reconstruction efficiency with the ATLAS Roman Pot detectors using an overlay technique of Monte Carlo signal events with zero-bias collider data.

The purpose of the ATLAS Roman Pot (ARP) detector is to measure protons scattered at very small angles. ARP aims to study elastic and diffractive events, exclusive production and photon induced interactions. In LHC Run 2, ARP participated in the ATLAS high-luminosity data taking. In addition, several special runs with reduced luminosity were taken. Any cross section measurement requires good understanding of the particle reconstruction efficiency. This task is particularly complicated in case of forward protons where actual beam condition is important part of the working environment. Modelling of the very forward region in terms of primary particle flux and inactive material producing secondary particle is generally not precise. An overlay technique of Monte Carlo signal events with zero-bias collider data overcome these difficulties and may provide better understanding of the proton reconstruction efficiency. This poster presents results of the proton reconstruction efficiency with the ARP detectors during the LHC Run 2.

Primary authors: ATLAS COLLABORATION; LAKOMIEC, Inga Katarzyna (AGH University of Science and Technology (PL))

Presenters: ATLAS COLLABORATION; LAKOMIEC, Inga Katarzyna (AGH University of Science and Technology (PL))

Session Classification: Poster session

Track Classification: Perform. / Tools
Exploring the dip in the differential elastic cross section from LHC energies to the limit of asymptotic energy.

We use three different formalisms to explore the evolution of the scaling variable (\(t_D\)) given by the transverse momentum squared times the total cross section, from LHC energies to the limit of high energy. Using the eikonal approximation, the grey disk model and the dipole and saturation model, we will show the comparison among these three formalisms in the \(t_D\) and in the evolution of the total cross section on the collision energy and data.

**Primary authors:** TÉLLEZ, Silem; BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX))

**Presenter:** TÉLLEZ, Silem

**Session Classification:** Poster session

**Track Classification:** QCD
ATLAS pixel cluster splitting using Mixture Density Network

The high energy and luminosity of the LHC allows to study jets and hadronically decaying tau leptons at extreme energies with the ATLAS tracking detector. These topologies lead to charged particles with an angular separation smaller than the size of the ATLAS Inner Detector sensitive elements and consequently to a reduced track reconstruction efficiency. In order to regain part of the track reconstruction efficiency loss, a neural network (NN) based approach was adopted in the ATLAS pixel detector in 2011 for estimating particle hit multiplicity, hit positions and associated uncertainties. Currently used algorithms in ATLAS will be briefly summarized. An alternative algorithm based on Mixture Density Network (MDN) is currently being studied and the initial performance is promising. As MDN can provide an estimate of position and uncertainty at the same time, the execution can be faster compared to current ATLAS NNs. An overview of MDN algorithm and its performance will be highlighted in the poster. At the same time a comparison will be made with the currently used NNs in ATLAS tracking.

Primary author: ATLAS COLLABORATION
Presenters: ATLAS COLLABORATION; KHODA, Elham E (University of British Columbia (CA))

Session Classification: Poster session
Track Classification: Perform. / Tools
Large-area scintillator detector of the Fast Interaction Trigger for the ALICE Experiment.

During the ongoing Long Shutdown 2 the accelerator complex at CERN will significantly improve the performance of the collider by boosting the heavy-ion collision parameters of Run 3 and 4 to well beyond the specifications of the current ALICE setup. For instance, the Pb-Pb instantaneous luminosity during Run 3 will increase by a factor of 5 to 6 and the minimum-bias (MB) Pb-Pb interaction rate will reach \( \sim 50 \) kHz, which is \( \sim 50 \) times more than the rate recorded by ALICE with heavy-ion collisions during Run 2. In order to remain operational during the Run 3 and Run 4 ALICE has to upgrade many of its subsystems or replace them with new solutions [1] including the new Fast Interaction Trigger (FIT) [2]. The main online functionalities of FIT will be luminosity monitoring with a direct link to the LHC and the generation of a fast trigger signal for ALICE subsystems. The trigger generated by FIT will allow for online vertex determination, minimum bias and centrality-based event selection, suppression of beam-gas events, and a veto for ultra-peripheral collisions. FIT is a hybrid detector composed of two Cherenkov detector arrays (T0+) and a large sectored scintillator ring (V0+). Due to the limited space, the V0+ scintillator disk will be located only on one side of the interaction point. Nevertheless, because of its large acceptance, V0+ will significantly improve determination of the centrality and the event plane.

The 1.5m diameter plastic scintillator disc of V0+ will be divided into 40 optically-separated cells, each grouped into eight 45o sectors and subdivided into 5 radial segments. The size of the radial segments follows equal steps in pseudo-rapidity coverage. The light from the scintillator will be collected by a matrix of clear, equal-length optical fibers coupled perpendicularly to the surface of the scintillator. At the other end the fibers will be grouped into bundles and read out by Hamamatsu H6614-70 fine-mesh PMTs. This light collecting scheme is characterized by high efficiency, uniform across the entire surface of the scintillator, single-MIP time resolution of around 150-300 ps, and the ability to cope with the required high dynamic range of 1-600 MIP. This presentation will focus on the design of the V0+ and on the outcome of the test results obtained with various prototypes including a full-size 45o section of the actual detector. These measurements were carried out using secondary beams from the CERN-PS accelerator.

We acknowledge the support from DGAPA-UNAM PAPIIT IN111117 and CONACYT 280362 grants.

Dark Matter Signals at the LHC from a 3HDM

We analyse new signals of Dark Matter (DM) at the Large Hadron Collider (LHC) in a 3-Higgs Doublet Model (3HDM) where only one doublet acquires a Vacuum Expectation Value (VEV), preserving a parity Z2. The other two doublets are inert and do not develop a VEV, leading to a dark scalar sector controlled by Z2, with the lightest CP-even dark scalar H1 being the DM candidate. This leads to the loop induced decay of the next-to-lightest scalar, H2→H1ff (f=u,d,c,s,b,e,μ,τ), mediated by both dark CP-odd and charged scalars. This is a smoking-gun signal of the 3HDM since it is not allowed in the 2HDM with one inert doublet and is expected to be important when H2 and H1 are close in mass. In practice, this signature can be observed in the cascade decay of the SM-like Higgs boson, h→H1H2→H1H1ff into two DM particles and di-leptons/di-jets, where h is produced from either gluon-gluon Fusion (ggF) or Vector Boson Fusion (VBF). However, this signal competes with the tree-level channel q̅q→H1H1Z∗→H1H1ff. We devise some benchmarks, compliant with collider, DM and cosmological data, for which the interplay between these modes is discussed. In particular, we show that the resulting detector signature, with missing energy and invariant mass of ff much smaller than mZ, can potentially be extracted already during Run 2 and 3. For example, the H2 → H1γ∗ and γ∗ → e+e− case will give a spectacular QED mono-shower signal.

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Presenter: ROJAS-CIOFALO, Diana (University of Southampton)

Session Classification: Poster session

Track Classification: Higgs
Weak dipole moments of the top quark and flavor violation

Beyond the electromagnetic properties of the top quark, there is also great interest in its static weak properties, which are associated with their interaction with the $Z$ boson. In the present work, the analytical calculation of weak dipole moments for the top quark is presented in the context of models with generalized current sectors, where the existence of a new neutral massive gauge boson, known as $Z'$, is predicted. Specifically, the impact of flavor changing neutral currents, mediated by this boson, on the weak dipole moments are calculated. The numerical evaluations are also carried out, and then compared with both the theoretical prediction in the standard model and the actual experimental setup.

Primary authors: Ms QUEZADAS-VIVIAN, Brenda (Universidad Michoacana de San Nicolas de Hidalgo); Dr TUTUTI, Eduardo Salvador (Universidad Michoacana de San Nicolas de Hidalgo); Dr RAMIREZ-ZAVALETA, Fernando (Universidad Michoacana de San Nicolas de Hidalgo); Dr MONTAÑO, Javier (Universidad Michoacana de San Nicolas de Hidalgo); Dr ARANDA, Jorge Isidro (Universidad Michoacana de San Nicolas de Hidalgo)

Presenters: QUEZADAS VIVIAN, Brenda; Ms QUEZADAS-VIVIAN, Brenda (Universidad Michoacana de San Nicolas de Hidalgo)

Session Classification: Parallel Top

Track Classification: TOP
Flavor violation in meson decays

Some extended models predict the existence of a new neutral massive gauge boson, identified as the $Z'$ boson, together with flavor-changing neutral currents. In this theoretical framework, we estimate the intensity of couplings regarding the interaction between the $Z'$ boson with the bottom and the strange quarks through the $B^0_s \rightarrow \mu^+\mu^-$ transition, which allow us to study the $B^0_s \rightarrow \tau\mu, \tau e, \mu e$ decays. We present preliminary results, where the corresponding branching ratios are estimated; our predictions are contrasted with similar ones coming from several extended models. In particular, our estimates for the branching ratios range between $10^{-9}$ and $10^{-6}$.

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**Session Classification:** Poster session

**Track Classification:** Electroweak
Results of the LHCf experiment in LHC Run II

After data taking in p-p collisions at $\sqrt{s} = 13$ TeV, the LHCf collaboration sustained a strong analysis effort in order to precisely measure neutral particle production in the very forward region at high energy. These results are expected to have a strong impact on the tuning of phenomenological models used to describe soft hadronic processes. In this contribution, we report about the measurement of differential production cross section of forward photons and neutrons generated from p-p collisions at $\sqrt{s} = 13$ TeV. Both analyses, already published by the collaboration, show that no model is able to satisfactorily reproduce the experimental observations in all the regions covered by LHCf.

In addition, the ATLAS-LHCf joint analysis, exploiting the ATLAS information in the central region, allows LHCf to identify different processes responsible for particle production in the forward region, especially distinguishing between diffractive and non-diffractive mechanisms. In this contribution, we discuss about the first result of this joint collaboration, released in a common conference note, relative to the role of diffraction processes in the production of forward photons generated from p-p collisions at $\sqrt{s} = 13$ TeV. After the photon analysis will have been published, the same procedure will be applied to the neutron case and some prospects in this analysis are also reported.

Finally, we present the preliminary results relative to forward photons generated from p-Pb collisions at $\sqrt{s_{NN}} = 8.16$ TeV in the proton remnant side, as measured by the LHCf Arm2 detector.

Primary author: Berti, Eugenio (Universita e INFN, Firenze (IT))
Presenter: Berti, Eugenio (Universita e INFN, Firenze (IT))
Session Classification: Poster session

Track Classification: QCD
ALICE results on radial flow in small and large systems

In ultra-relativistic heavy-ion collisions at LHC energies, a strongly interacting Quark-Gluon-Plasma (sQGP) is produced. This sQGP behaves like a perfect liquid and its hydrodynamic expansion gives rise to radial flow in heavy-ion collisions. However, similar phenomena have recently also been observed in small collision systems (pp and p−A). Current research therefore tries to identify the underlying mechanisms which lead to collective behaviour and whether a unified description of the pp, p−A and A−A data can be established.

In this poster, an overview of new results from the ALICE Collaboration, which contribute to the understanding of radial flow, will be presented. The ALICE Collaboration has measured the centrality dependence of the transverse momentum ($p_T$) distributions of inclusive charged particles and identified pions, kaons, and protons in Pb−Pb collisions at the unprecedented collision energy of 5.02 TeV. The results will be compared to Pb−Pb data at lower energy, as well as to analogous measurements using p−Pb and pp data at 5.02 and 7 TeV, respectively. The system size dependence of radial flow will be discussed and comparisons with models will be shown.

Primary author: VAZQUEZ RUEDA, Omar (Lund University (SE))
Presenter: VAZQUEZ RUEDA, Omar (Lund University (SE))
Session Classification: Poster session
Track Classification: Heavy Ions
We revisit the rare decay of the Higgs boson into two different quarks at the one-loop level in the Standard Model. We implement the GIM mechanism in a strict manner, by performing meticulous Taylor expansions of the amplitude’s form factors, in order to get rid of spurious terms. We predict $\text{Br}(H \to uc) = 1.63 \times 10^{-18}$, $\text{Br}(H \to ds) = 9.07 \times 10^{-15}$, $\text{Br}(H \to db) = 1.03 \times 10^{-8}$, $\text{Br}(H \to sb) = 2.44 \times 10^{-7}$; our $\text{Br}(H \to uc, ds)$ are more suppressed than those previously reported in the literature.

**Primary authors:** Dr TUTUTI, Eduardo Salvador (Universidad Michoacana de San Nicolas de Hidalgo); Dr RAMIREZ-ZAVALET, Fernando (Universidad Michoacana de San Nicolas de Hidalgo); Mr GONZALEZ-ESTRADA, Guillermo (Universidad Michoacana de San Nicolas de Hidalgo); Dr MONTAÑO, Javier (Universidad Michoacana de San Nicolas de Hidalgo); Dr ARANDA, Jorge Isidro (Universidad Michoacana de San Nicolas de Hidalgo)

**Presenters:** Mr GONZALEZ-ESTRADA, Guillermo (Universidad Michoacana de San Nicolas de Hidalgo); GONZÁLEZ ESTRADA, Guillermo (UMSNH)

**Session Classification:** Poster session

**Track Classification:** Higgs
Gain and time resolution of thin Low Gain Avalanche Detectors.

The CMS MIP Timing Detector, proposed for the HL-LHC upgrade, will be instrumented with $O(10)$ square meters of ultra-fast Silicon detectors (UFSD) in the forward region. These UFSDs are aimed at measuring the time of passage of each track with a precision of about 30 ps. The sensor that will be used for this task is the low gain avalanche detectors (LGAD). In this contribution, we will present the latest results from laboratory measurements on 50 and 35 µm thick LGADs fabricated by CNM. We will concentrate on the timing performance of the sensors. Additionally the electric characterisation of the sensor will be discussed.

**Primary author:** DEL BURGO, Riccardo (Universitaet Zuerich (CH))

**Presenter:** DEL BURGO, Riccardo (Universitaet Zuerich (CH))

**Track Classification:** Upgrade
Projections for di-Higgs measurements in the \(bbZZ(4l)\) final state with the CMS experiment at the HL-LHC

Prospects for the study of Higgs boson pair (HH) production in the \(HH \rightarrow bb4l\) \((l = e, \mu)\) channel are studied in the context of the High-Luminosity LHC. The analysis is performed using a parametric simulation of the Phase-2 CMS detector response provided by the Delphes software and assuming an average of 200 proton-proton collisions per bunch crossing at a center-of-mass energy of 14 TeV. Assuming a projected integrated luminosity of 3000 fb\(^{-1}\), the expected significance for the non-resonant Standard Model (SM) signal is 0.37 \(\sigma\); a 95% confidence level (CL) upper limit on its cross section is set to 6.6 times the SM prediction. The statistical combination of five decay channels (\(bbbb, bbWW, bb\tau\tau, bb\gamma\gamma, \) and \(bbZZ\)) results in an expected significance for the standard model HH signal of 2.6 \(\sigma\) and an expected 68% and 95% CL intervals for the self-coupling modifier \(\kappa \lambda = \lambda_{[HHH]} / \lambda_{[HHH]}^{SM}\) of [0.35, 1.9] and \([-0.18, 3.6]\), respectively.

**Primary author:** FONTANESI, Elisa (Universita e INFN, Bologna (IT))

**Presenter:** FONTANESI, Elisa (Universita e INFN, Bologna (IT))

**Session Classification:** Poster session

**Track Classification:** Higgs
The Tracker Endcap Pixel detector for CMS phase II upgrade

After the high-luminosity upgrade of the LHC (HL-LHC), the instantaneous luminosity will increase to unprecedented values of $5-7 \times 10^{34} \text{cm}^{-2}\text{s}^{-1}$. In order to cope with these conditions the whole CMS silicon tracker detector will be replaced. This presentation describes the upgrade of the inner pixel system. The new inner pixel detector will be composed of three sub-detectors: the barrel detector (TBPX) consisting of four concentric cylindrical layers, the forward detector (TFPX) consisting of eight small disks on each side, and the endcap detector (TEPX) with four large disks on each side. Each of these systems will cover a different region in pseudorapidity, with TEPX extending the coverage up to $|\eta|<4.0$. The upgraded detector will feature a new readout chip and sensor design, with a pixel area six times smaller than the present one. Furthermore, the services will be redesigned for the new system. In this contribution the new TEPX detector will be presented, with particular focus on the new layout, services, and physics performance of the system.

**Primary author:** DEL BURGO, Riccardo (CMS, Universitaet Zuerich (CH))  
**Presenter:** DEL BURGO, Riccardo (CMS, Universitaet Zuerich (CH))  
**Track Classification:** Upgrade
Search for a pair production of dark photons via the Higgs portal at CMS

The Standard Model (SM) is known to be incomplete, it fails at explaining the nature of the cosmological observed dark matter. The introduction of a Dark Sector via an additional U(1)d gauge symmetry added to the SM Lagrangian provides a mechanism to introduce much needed new physics without perturbing the agreement between SM theoretical description and the Electroweak Precision Observables. The breaking of a new U(1)d symmetry gives rise to a massive dark photon, this dark photon can couple to SM particles via a small kinetic mixing parameter (epsilon). In this talk we review a search for a pair production of dark photons in a final state with 4 muons, with a dataset of 35.9fb-1 collected by CMS during 2016, methods to estimate SM background and observed experimental limits are presented, such limits in the 2D plane defined by epsilon and the mass of the dark photon cover an unexplored area. The plans to extend the search for an updated analysis with the whole Run-2 CMS dataset are discussed.

Primary authors: CASTANEDA, Alfredo (Universidad de Sonora (MX)); Dr CASTANEDA, Alfredo

Presenter: Dr CASTANEDA, Alfredo

Session Classification: Poster session

Track Classification: Higgs
CMS luminosity measurement for the 2018 data-taking period at $\sqrt{s} = 13$ TeV

Maximally precise calibration of the CMS luminosity measurement is critical for many physics measurements. To guarantee high quality absolute calibration, a complete van der Meer scan program was carried out at the CMS experiment in 2018. The systematic uncertainty on the absolute calibration from the van der Meer scans is derived with a precision of 2.1%. The performance and stability of the CMS luminometers is also evaluated using emittance scans taken throughout the course of the year, which allows for independent nonlinearity measurements and correction for each luminometer. Cross-detector stability and linearity, together with the normalization uncertainty from the van der Meer scans, results in a total luminosity uncertainty of 2.5%. The dominant systematic uncertainty arises from the x-y correlations of the beam shape, with other major contributions from stability and nonlinearity effects.

**Primary author:** BENITEZ, Jose Feliciano (Universidad de Sonora (MX))

**Presenter:** BENITEZ, Jose Feliciano (Universidad de Sonora (MX))

**Session Classification:** Poster session

**Track Classification:** Perform. / Tools
Relative nonlinearity of BRIL luminometers derived from CMS mu-scans

For precise calibration of luminosity measurements, it is necessary to understand nonlinear effects which affect the single bunch instantaneous luminosity (SBIL) measured by a luminometer. The CMS BRIL group uses data from the hadronic forward (HF) calorimeter, the Pixel Luminosity Telescope (PLT), and the Fast Beam Conditions Monitor (BCM1F) to measure the luminosity. A “mu scan” is a beam scan performed at specific conditions suitable for evaluating the luminometer linearity. During the scan the beam separation is varied so as to produce a resulting SBIL in the range 1–10 Hz/μb. Then, the analysis of luminometer linearity is carried out with respect to HFOC (HF using occupancy method for luminosity calibration). HFOC is considered to have the best linearity, so it is used as a reference scale. Also, a cross-check using the pixel cluster counting (PCC) method is used when PCC data is available. In this report, the summary of 2018 mu scans is presented, and the influence of nonlinear terms in measurements of luminosity is analyzed.

Primary author: Dr BABAEV, Anton (Tomsk Polytechnic University)
Presenter: Dr BABAEV, Anton (Tomsk Polytechnic University)
Session Classification: Poster session
Track Classification: Perform. / Tools
Calibration and performance of the CMS pixel detector in LHC Run 2

The Compact Muon Solenoid (CMS) is one of two general-purpose detectors that reconstruct the products of high energy particle interactions at the Large Hadron Collider at CERN. The silicon pixel detector is the innermost component of the CMS tracking system. It determines the trajectories of charged particles originating from the interaction region with high resolution enabling precise momentum and impact parameter measurements in the tracker. It is designed to operate in the high particle density environment of the LHC. The calibration of the pixel detector plays an important role in its performance. The calibration constants follow the physical changes in the sensors that are mostly induced by irradiation. These constants are regularly updated, maintained in a calibration database and used for the event reconstruction. In this poster we will present details on the offline calibration procedures and their effects on detector performance during the Run 2 period of LHC.

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Presenter: VAMI, Tamas Almos (Wigner RCP, Budapest (HU))
Session Classification: Poster session
Track Classification: Perform. / Tools
Calibration and Performance of the ATLAS Tile Calorimeter During the LHC Run 2

The Tile Calorimeter (TileCal) is the central section of the hadronic calorimeter of the ATLAS experiment and provides important information for reconstruction of hadrons, jets, hadronic decays of tau leptons and missing transverse energy. It also assists in muon identification. This sampling calorimeter uses steel plates as absorber and scintillating tiles as active medium. The light produced by the passage of charged particles is transmitted by wavelength shifting fibres to photomultiplier tubes (PMTs). The readout is segmented into about 5000 cells (longitudinally and transversally), each of them being read out by two PMTs in parallel. TileCal exploits several calibration systems: a Cs radioactive source that illuminates the scintillating tiles directly, a laser light system to directly test the PMT response, and a charge injection system (CIS) for the front-end electronics. These systems together with data collected during proton-proton collisions provide extensive monitoring of the instrument and a means for equalising the calorimeter response at each stage of the signal propagation. The performance of the calorimeter has been established with cosmic ray muons and the large sample of the proton-proton collisions. The response of high momentum isolated muons is used to study the energy response at the electromagnetic scale, isolated hadrons are used as a probe of the hadronic response. The calorimeter time resolution is studied with multijet events. A description of the different TileCal calibration systems and the results on the calorimeter performance during the LHC Run 2 will be presented. The results on the pile-up noise and response uniformity studies with MC will also be discussed.

Primary author: ATLAS COLLABORATION
Presenter: ATLAS COLLABORATION
Session Classification: Poster session
Track Classification: Perform. / Tools
Upgrade of the ATLAS Tile Calorimeter for the High Luminosity LHC

The Tile Calorimeter (TileCal) is the hadronic calorimeter covering the central region of the ATLAS experiment. TileCal is a sampling calorimeter with steel as absorber and scintillators as active medium. The scintillators are read-out by wavelength shifting fibers coupled to photomultiplier tubes (PMTs). The analogue signals from the PMTs are amplified, shaped, digitised by sampling the signal every 25 ns and stored on detector until a trigger decision is received. The High-Luminosity phase of LHC (HL-LHC) expected to begin in year 2026 requires new electronics to meet the requirements of a 1 MHz trigger, higher ambient radiation, and for better performance under high pileup. Both the on- and off-detector TileCal electronics will be replaced during the shutdown of 2024-2025. PMT signals from every TileCal cell will be digitised and sent directly to the back-end electronics, where the signals are 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 data integrity and reliability of the system.

Results are presented from a prototype of the new electronics (demonstrator) that was inserted in a TileCal module and tested in CERN's H8 beam line with electrons, muons, and hadrons. The demonstrator is undergoing extensive testing and will be inserted in the ATLAS detector during the current shutdown.

Primary author: ATLAS COLLABORATION
Presenter: ATLAS COLLABORATION
Track Classification: Upgrade
Readiness of the ATLAS Tile Calorimeter link daughterboard for the High Luminosity LHC era

The Phase-II upgrade plan for the ATLAS Tile Calorimeter facing the High Luminosity LHC (HL-LHC) era includes approximately 1024 radiation-tolerant readout link and control boards (Daughterboards) that will provide full granularity digital data to a fully-digital trigger system off-detector through multi-Gbps optic fibers. The Daughterboard design minimises radiation-induced errors and enhances data reliability by: embracing a fully double redundant design, using CERN radiation hard GBTx ASICs and Kintex Ultrascale+ FPGAs, implementing Triple Mode Redundancy in the FPGA firmware, and using CRC error verification in the redundant uplinks while FEC is handled by the each GBTx in each downlink. We have performed TID, NIEL and SEE radiation tests in order to assess the radiation tolerance strategies followed in the design and to qualify the Daughterboard for the HL-LHC requirements according to the ATLAS policy on radiation tolerant electronics. Over the HL-LHC lifetime, the Daughterboard positioned on the most radiation exposed area will have to withstand 23.57 kRad of Total Ionising Dose, a total Non-Ionising Energy Loss corresponding to 1.12655E12 - 1 MeV equivalent neutron fluence, and seamlessly run and recover from any single event upset and single event latch-up for a fluence of 1.35987 E11 protons per cm2.

We present the current results of these tests, aiming to demonstrate the readiness of the Daughterboard to withstand the radiation requirements imposed by the HL-LHC.

Primary author: ATLAS COLLABORATION
Presenter: ATLAS COLLABORATION
Session Classification: Poster session
Track Classification: Perform. / Tools
ATLAS Outreach: on the dissemination of High Energy Physics and Computer Sciences

The members of large High Energy Physics (HEP) collaborations come from all over the world. They understand that one significant challenge in teaching experimental HEP is the current location of many potential and valuable students and young researchers. In the case of ATLAS, many of its members come from Latin-American, Middle Eastern and Sub-Saharan countries. Also, they recognise the massive potential that the always-increasing university student population has regarding expanding this experimental field, not only concerning the fundamental physics but also the computing and Big Data analysis skills. For that reason, several outreach teams, which include ATLAS, IPPOG, CEVALE2VE members and many other researchers, have been developing and examining costless Open Source technologies to release data and to provide effective web-based and offline environments to run, produce, save and share HEP analysis. After several years, and with the help of other outreach programs like the Virtual Visits, ATLAS established an active community that is not just releasing knowledge, data and resources but genuinely training new physicists who are pursuing advanced studies in experimental HEP right now. We will present the resources, community, results and ideas that have emerged from these efforts.

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Presenter:  MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE))

Session Classification:  Poster session

Track Classification:  Outreach
QCD low x evolution and the onset of gluon saturation in exclusive photo-production of vector mesons

We investigate the energy dependence of the photo-production cross-section of vector mesons $J/\Psi$ and $\Upsilon$, which has been measured by both HERA experiments H1 and ZEUS in electron-proton collisions and by LHC experiments ALICE, CMS and LHCb in ultra peripheral proton-proton and ultra peripheral proton-lead collisions. Our study uses 2 particular fits of inclusive unintegrated gluon distribution, based on non-linear Baltisky-Kovchegov evolution (Kutak-Sapeta gluon; KS) and next-to-leading order Baltisky-Fadin-Kuraev-Lipatov evolution (Hentschinski-Sabio Vera-Salas gluon; HSS). We find that linear next-to-leading order BFKL evolution can only describe $J/\Psi$ production at highest energies, if perturbative corrections are increased to unnaturally large values; rendering this corrections small, the growth with energy is too strong in the LHC region and the description of data fails. For the KS gluon we find that an accurate description of $J/\Psi$ data is possible if non-linear corrections to low $x$ QCD evolution are taken into account; without such correction a description of data fails. We interpret this observation as a clear signal for the presence of high gluon densities in low $x$ the proton, characteristic for the onset of gluon saturation.

Primary authors: HENTSCHINSKI, Martin (Universidad de las Americas, Puebla); KUTAK, Krzysztof (Instytut Fizyki Jadrowej Polskiej Akademii Nauk)

Presenter: HENTSCHINSKI, Martin (Universidad de las Americas, Puebla)

Session Classification: Poster session

Track Classification: QCD
Recent kaon decay results from NA62

In this poster we will present the recent results from the NA62 experiment at CERN. NA62 is an experiment dedicated to the study of rare kaon decays. Important results such as the Branching Ratio of $K^+ \rightarrow \pi^+\nu\bar{\nu}$, the search for heavy neutral leptons and the search for lepton number violating kaon decays will be shown.

Primary authors: ESTRADA TRISTAN, Nora Patricia; ON BEHALF OF THE NA62 COLLABORATION

Presenter: ESTRADA TRISTAN, Nora Patricia

Session Classification: Poster session

Track Classification: Electroweak
ALICE (A Large Ion Collider Experiment) is one of the four main experiments at the CERN Large Hadron Collider. The ALICE collaboration plans a major detector upgrade during long shutdown 2, which started at the end of 2018, followed by Run 3 starting in 2021. In Run 3 ALICE will be able to collect 10 nb$^{-1}$ of Pb-Pb collisions at luminosities up to $L = 6 \times 10^{27}$ cm$^{-2}$ s$^{-1}$ corresponding to collision rates of 50 kHz, using a different readout strategy. The ALICE upgrade will also make possible the collection of 6 pb$^{-1}$ of pp collisions at the equivalent Pb-Pb nucleon energy as well as 50 pb$^{-1}$ of p-Pb collisions, both at collision rates of up to 200 kHz. With these physics goals, the statistics of data in ALICE will be increased by a factor of 100 over the numbers achieved with the present ALICE detector up to LS2. The ALICE upgrade will require a very different triggering strategy with respect to the current and hence a new Central Trigger System (CTS) is needed. The ALICE-CTS will be completely redesigned and the strategy for selecting events will be different from that employed in previous runs. The CTS will have a Central Trigger Processor (CTP) and Local Trigger Units (LTUs) as detector interface. However, the heart of the CTS will be a trigger board referred to as ALICE Trigger Board (ATB), based on a Kintex UltraScale FPGA, and the use of a novel Timing Trigger Control system based on Passive Optical Networks (TTC-PON). An overview and an account of the current status of the ALICE-CTS will be presented.

Primary author: PEREZ MORENO, Luis Alberto (Autonomous University of Puebla (MX))

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Presenter: PEREZ MORENO, Luis Alberto (Autonomous University of Puebla (MX))

Track Classification: Upgrade
Eco gas studies for the CMS iRPC for the High Luminosity LHC

We will present a summary of the performance of the improved RPC (iRPC) using several RPC gas mixtures with a low Global Warming Potential (GWP). We have replaced the Freon (R134a) from the official CMS gas mixture with HFO and CO2. The results show promising mixtures for the iRPC for the High Luminosity LHC.

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Co-authors: CMS RPC GROUP; CARRILLO MORENO, Salvador (Universidad Iberoamericana (MX))

Presenter: RAMÍREZ GUADARRAMA, Dalia Lucero (Universidad Iberoamericana (MX))

Track Classification: Upgrade
ALICE data in the framework of the Color String Percolation Model.

We present the results obtained in the extraction of the main parameters of the QCD inspired approach towards the high density phase transition. Using the percolation model to define the main parameters we have extracted them for all the LHC experimental results from pp to PbPb collisions.

**Primary author:** E. CUAUTLE, A. MISHRA, G. PAIC, C. PAJARES, R. P. SCHARENBERG AND B SRIVASTAVA

**Presenters:** E. CUAUTLE, A. MISHRA, G. PAIC, C. PAJARES, R. P. SCHARENBERG AND B SRIVASTAVA; MISHRA, Aditya Nath (ICN-UNAM)

**Session Classification:** Poster session

**Track Classification:** Heavy Ions
Study of the underlying event characteristics in function of the multiplicity and leading particle transverse momentum

The behavior of the underlying event density dependence on the leading particle transverse momentum has been widely reported and used to tune MC generators to the data of pp collisions. However to our knowledge all the studies have been done, both in data and generators for minimum bias data. We present a work that investigates the behavior of the underlying event in function of the multiplicity and the leading particle transverse momentum. The spectra of the corresponding underlying part of the events will be shown and results discussed.

Primary authors: PAIC, Guy (Universidad Nacional Autonoma (MX)); Dr MISHRA, Aditya Nath (ICN-UNAM)

Presenter: PAIC, Guy (Universidad Nacional Autonoma (MX))

Session Classification: Poster session

Track Classification: Heavy Ions
Intriguing similarities of high-pT particle production between pp and A-A collisions

We study the particle production at high transverse momentum (pT>8 GeV/c) in pp and Pb-Pb collisions at LHC energies. The characterization of the spectra is done using a power-law function and the resulting power-law exponent (n) is studied as a function of xT for minimum-bias pp collisions at different √s. The functional form of n as a function of xT exhibits an approximate universal behavior. PYTHIA8.212 reproduces the scaling properties and therefore, it is used to study the multiplicity-dependent particle production. Going from low to high multiplicities, the power-law exponent decreases. A similar behavior is also observed in heavy-ion collisions when one studies the centrality-dependent particle production. The interpretation of heavy-ion results requires the quantification of the impact of this correlation (multiplicity and high pT) on jet-quenching observables.

Primary authors: ORTIZ VELASQUEZ, Antonio (Universidad Nacional Autonoma (MX)); MISHRA, Aditya Nath (ICN-UNAM); PAIC, Guy (Universidad Nacional Autonoma (MX))

Presenter: PAIC, Guy (Universidad Nacional Autonoma (MX))

Session Classification: Poster session

Track Classification: Heavy Ions
Time resolution analysis of detectors based on plastic scintillators coupled to silicon photomultipliers

The performance of several trigger counters based on plastic scintillators with silicon photomultiplier readout is investigated with cosmic rays. Efficiency and time resolution are measured using digital waveform analysis. The obtained results are relevant for trigger subsystems of Baryonic Matter at the Nuclotron (BM@N) and Multi-Purpose Detector (MPD) at the NICA heavy-ion collider. The results show very high efficiency and good timing performance of the counters.

**Primary authors:** AYALA-TORRES, Marco Alberto (Center for Research and Advanced Studies (Cinvestav)); Prof. MONTANO, Luis Manuel (Center for Research and Advanced Studies (Cinvestav)); FONTAINE, Marcos (Center for Research and Advanced Studies (Cinvestav))

**Presenter:** AYALA-TORRES, Marco Alberto (Center for Research and Advanced Studies (Cinvestav))

**Session Classification:** Poster session

**Track Classification:** Heavy Ions
Ridge like correlation structure in high multiplicity pp collisions

One of the key signatures of collectivity in heavy-ion collisions is the appearance of a ridge structure over wide pseudorapidity interval. In this work we explore the contributions from the geometry fluctuations in the initial-state in pp collisions to the ridge structure, estimated from low to high density. Effects show to be relevant for small collision systems unlike in heavy-ion collisions where the contributions are negligible.

Primary authors: BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX)); Mr FIERRO ROJAS, Pablo (IF-BUAP)

Presenter: Mr FIERRO ROJAS, Pablo (IF-BUAP)

Session Classification: Poster session

Track Classification: Heavy Ions
Lambda_{c}/D^{0} ratio on high multiplicity pp collisions at LHC

High multiplicity pp collisions had shown signals of the possible formation of a collective state on which the clustering color sources give a natural description of the production of strong color fields due to the partonic interactions. We explore the production of Lambda_{c}/D^{0} ratio on high multiplicity pp collisions as a consequence of the production of heavy flavors and the early time dynamics of the collisions.

Primary authors: Mr RUIZ OLIVARES, ALAN IBRAHIM (BUAP); BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX))

Presenter: Mr RUIZ OLIVARES, ALAN IBRAHIM (BUAP)

Track Classification: Heavy Flavour
The ratio of pion, kaon and proton particle production in high multiplicity pp over dilute pp at LHC energies

We study the ratio of the pion, kaon and proton particle production on high multiplicity pp collisions at LHC energies, over the transverse momentum spectra corresponding to the energy density of a dilute system in the framework of clustering of color sources to describe the suppression due to initial state effects. Results show suppression for all the multiplicity classes with the strongest effect for the highest multiplicity case.

Primary authors: BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX)); Mr MANCILLA XINTO, Nestor Raul (BUAP); CASTRO SAM, Maria Magdalena (BUAP); Ms LEAL REYES, Nadia Mariana (BUAP)

Presenters: Mr MANCILLA XINTO, Nestor Raul (BUAP); CASTRO SAM, Maria Magdalena (BUAP); Ms LEAL REYES, Nadia Mariana (BUAP)

Session Classification: Poster session

Track Classification: Heavy Ions
Evolution of the unitarity saturation in the pp and np total cross section to the asymptotic limit

By using the interplay between the growth of the transverse size of the proton in the high energy limit, and the gluonic matter density, with unitarity saturation based on a grey disk model. We explore the evolution of the unitarity saturation in the pp and np total cross section to the asymptotic limit to the geometric scaling.

Primary authors: Ms ROBLES JACOBO, Cristal; BAUTISTA GUZMAN, Irais (Autonomous University of Puebla (MX))

Presenter: Ms ROBLES JACOBO, Cristal

Session Classification: Poster session

Track Classification: QCD
PPS results and prospects from CMS-TOTEM

We will present the first results and the physics prospects from the CMS Precision Proton Spectrometers namely the observation of exclusive dileptons at high mass, and the search for quartic anomalous couplings and axion like particles at high masses at the LHC in the CMS collaboration.

**Primary author:** BALDENEGRO BARRERA, Cristian (The University of Kansas (US))

**Presenter:** BALDENEGRO BARRERA, Cristian (The University of Kansas (US))

**Session Classification:** Poster session

**Track Classification:** Electroweak
Spherocity study for Fragmentation Functions using Pythia MC generator

The QCD factorization theorem describes the charged particles production process in strong interactions in high energy collisions. These formalism allow us to understand the perturbative (p-QCD) and non-perturbative regime of QCD. Using p-QCD it is possible to calculate the partonic cross sections of short distance processes; however, hadronic processes can not be computed fully with perturbative QCD due to the non-pertubative nature of hadronization. In this regard, universal long distance functions, such as the Parton Distribution Functions and the Fragmentation Functions (FF) are used to complete the whole dynamics of hadron collisions. The FF represents the probability of a parton carrying a fraction z of momentum to form a certain kind of hadron. In this work we implement an study in order to find if these probabilities differ on the shape of the process. In particular, we perform an study on the spherocity event shape under Pythia Monte Carlo event generator framework.

Primary author:  BELLO MARTINEZ, Hector
Presenter:  BELLO MARTINEZ, Hector
Session Classification:  Poster session
Track Classification:  QCD
Report on outreach activities at LHC

Monday, 20 May 2019 12:30 (15 minutes)

Presenter: NELLIST, Clara (Georg August Universitaet Goettingen (DE))

Session Classification: Opening Plenary
Communicating ATLAS: adapting to an ever-changing media landscape

Communicating the status and achievements of the ATLAS Experiment has been a core objective of the ATLAS Collaboration since its founding. To match an ever-changing media landscape, ATLAS has tailored its communication strategy to produce content that effectively targets key audiences. The comprehensive approach of ATLAS communications is explored, with a focus on strategic themes, effective distribution channels, and message. The success of this approach is examined and the effect on user experience is evaluated.

**Primary authors:** ANTHONY, Katarina (Universita degli Studi di Udine (IT)); MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE))

**Presenter:** MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE))
Analysis of Requirements for the Design of a Detector Control System in a High Energy Physics Experiment

Precise knowledge of what a system requires is a principle that unquestionably marks the success or failure of a software development. Establishing and managing the requirements for the design of a system are fundamental aspects of software engineering. One of the main software systems in a High Energy Physics (HEP) experiment is the Detector Control System (DCS). The DCS allows the control, monitoring and configuration of the experimental equipment either from a single on-site place or remotely, through a Supervisory Control and Data Acquisition (SCADA) system. Likewise, DCS manages communications with various experiment’s services and systems, such as: the accelerator, cooling systems, electricity, magnets, safety, access control, among others; in addition to providing feedback to them.

On the other hand, the design, simulation, construction, installation, commissioning and operation of a detector in a HEP experiment are usually very complicated tasks. In addition to the large number of detectors and sub-detectors that need to be controlled independently by the corresponding DCS, there are also huge conceptual and structural differences among them, such as: types of events to be analyzed with particles collisions or cosmic rays, dimensions, materials (semiconductors, plastic scintillators, gas chambers), parameters to be monitored (temperature, radiation, magnetic field, position, cryogenic system, etc.), type of control actuators (cooling, high and low voltage channels, gas system, etc.), infrastructure, number of readout channels, etc. This complexity and diversity of detectors should always be considered when defining and specifying the requirements of the experiment’s control system.

Based on the above an initial methodology that specifies and standardizes the requirements for the development, commissioning and operation of the software for a DCS should always be carried out when designing or upgrading a HEP experiment.

This work includes a brief description of the wide diversity of elements and aspects to be considered in the design of a detector control system. Subsequently, general definitions for the analysis of requirements in the design of a DCS are shown. Finally, the characteristics, functional and non-functional requirements and the use cases of main actors involved in the design, implementation and operation of these software systems are specified.

Primary author: CABANILLAS NORIS, Juan Carlos

Co-authors: MARTINEZ HERNANDEZ, Mario Ivan (Autonomous University of Puebla (MX)); ROJAS TORRES, Solangel (Universidad Autonoma de Sinaloa (MX)); LEON MONZON, Ildefonso (Universidad Autonoma de Sinaloa (MX))

Presenter: CABANILLAS NORIS, Juan Carlos

Session Classification: Poster session

Track Classification: Perform. / Tools
Report from Young Scientist Fora at LHC

Monday, 20 May 2019 12:45 (15 minutes)

Presenter: UMAKA, Ejiro Naomi (University of Houston (US))
Session Classification: Opening Plenary
CP violation in beauty and charm

Session Classification: Opening Plenary
Contribution ID: 76

Type: Talk

Rare decays

Session Classification: Opening Plenary
Lepton Universality

Session Classification: Opening Plenary
Theory (focussing on new physics interpretations)

Presenter: PICH, Antonio (IFIC, U. Valencia -.)
Session Classification: Opening Plenary
HF production & spectroscopy

Presenter: PACHMAYER, Yvonne Chiara (Ruprecht Karls Universitaet Heidelberg (DE))
Session Classification: Opening Plenary
Searches for heavy resonances (w and w/o jet substructure; including Z’, W’, dijets, dibosons)

Session Classification: Opening Plenary
Searches for new heavy particles (including vector-like quarks, leptoquarks)

Session Classification: Opening Plenary
Searches for long-lived particles and other unconventional signatures (incl heavy neutral leptons, dark photon searches, H->4 leptons via $Z_{dark}$, etc.)

Session Classification: Opening Plenary
Searches for dark matter

Session Classification: Opening Plenary
Theory talk

Presenter: TAIT, Tim M.P. (University of California, Irvine)
Session Classification: Opening Plenary
Recent progress in PDF fits using LHC data

Presenter: FORTE, Stefano (Università degli Studi e INFN Milano (IT))
Session Classification: Opening Plenary
State of the art calculations for top, Higgs and jet production (includes MC)

**Presenter:** BONCIANI, Roberto (Dipartimento di Fisica)

**Session Classification:** Opening Plenary
Production of top quarks, jets and photons (Higgs ?)

Session Classification: Opening Plenary
Jet substructure and W/Z and top production in association with jets and heavy flavour

Session Classification: Opening Plenary
Thermalization, hydrodynamization, and kinetic theory in the strong interaction

Presenter: TEANEY, Derek (Stony Brook University)
Session Classification: Opening Plenary
Particle production vs. multiplicity and flow-like effects in small systems

**Presenter:** ORTIZ VELASQUEZ, Antonio (Universidad Nacional Autonoma (MX))

**Session Classification:** Opening Plenary
Hard probes (energy loss, jets, gamma/W/Z-jet, jet substructure)

Session Classification: Opening Plenary
Contribution ID: 92

Type: Talk

Open and hidden heavy-flavor production and flow

Session Classification: Opening Plenary
Probes of hadronization (resonances, (hyper)nuclei, charm baryons, coalescence)

Presenter: LEA, Ramona (Università e INFN Trieste (IT))
Session Classification: Opening Plenary
Production of single top and of top quark pair in association with W/Z, gamma

Session Classification: Opening Plenary
Contribtion ID: 95

Type: Talk

Top properties: mass, spin correlation and polarisation

Session Classification: Opening Plenary
Precision electroweak (include W mass and electroweak angle and prospects)

Session Classification: Opening Plenary
Precision SM calculations including QCD, QCD-EW and EW corrections

**Presenter:** MELNIKOV, Kirill (Karlsruhe Institute of Technology, Germany)

**Session Classification:** Opening Plenary
Theory talk: uncertainties on top mass and W mass determination (incl. signal modeling issues for W mass measurement)

**Presenter:** VICINI, Alessandro

**Session Classification:** Opening Plenary
Phenomenology of Higgs physics (theory, broad talk incl. BSM)

Presenter: REINA, Laura (Florida State University (US))
Session Classification: Opening Plenary
Higgs couplings & properties (ATLAS+CMS)

Session Classification: Opening Plenary
Differential Higgs (ew interpretation) and diboson cross sections (ATLAS+CMS)

Session Classification: Opening Plenary
Contribution ID: 102

Type: Talk

Rare and exotic Higgs decays, incl. new scalars (ATLAS+CMS)

Session Classification: Opening Plenary
VBS & di-Higgs, incl. prospects (ATLAS+CMS)

Session Classification: Opening Plenary
Global fits of the SM parameters

**Presenter:** ERLER, Jens (IF-UNAM)

**Session Classification:** Opening Plenary
Studies of rare top processes: $tZ$, $t\gamma$, 4-top, FCNC, anomalous couplings

Session Classification: Opening Plenary
Studies of rare EW processes at the LHC Diboson and Triboson production (including prospects)

Session Classification: Opening Plenary
Uncertainties on rare top/EW prediction and theoretical implications of rare measurements (e.g. constraints on ttH and tH for example)

Presenter: PAGANI, Davide (TUM - Garching bei München)
Session Classification: Opening Plenary
Organised discussion on LHC sensitivity with EFT

Session Classification: Opening Plenary
Strong SUSY production

Session Classification: Opening Plenary
Electroweak SUSY production

Session Classification: Opening Plenary
3rd generation

Session Classification: Opening Plenary
RPV + stealth SUSY (LLP + unconventional signatures)

Session Classification: Opening Plenary
SUSY theory (broad aspects of SUSY relevant to full Run 2 and upcoming Run 3 data; areas of opportunity)

Presenter:  WAGNER, Carlos E.M. (University of Chicago)

Session Classification:  Opening Plenary
Future of heavy ions and Alice

Presenter:   WINN, Michael Andreas (Université Paris-Saclay (FR))
Session Classification:  Opening Plenary
Plans and prospects for flavor physics at LHC

Session Classification: Opening Plenary
Future upgrades at ATLAS+CMS (possibly focused on timing detectors, trigger and software)

Session Classification: Opening Plenary
Future colliders beyond LHC; physics reach; ideas for BSM physics, etc.

Presenter:  WULZER, Andrea (CERN and EPFL)
Session Classification:  Opening Plenary
Organized discussion

Session Classification: Opening Plenary
CP violation in beauty and charm

Monday, 20 May 2019 16:30 (20 minutes)

Presenter: GANDINI, Paolo (INFN Milano (IT))
Session Classification: Plenary I
**Rare decays**

*Monday, 20 May 2019 16:54 (20 minutes)*

**Presenter:** LEONARDO, Nuno (LIP)

**Session Classification:** Plenary I
Lepton Universality

Presenter: ALVAREZ CARTELLE, Paula (Imperial College (GB))
Session Classification: Plenary I
Theory (focussing on new physics interpretations)

Monday, 20 May 2019 17:18 (20 minutes)

Presenter:  PICH, Antonio (IFIC, U. Valencia -.)
Session Classification:  Plenary I
HF production & spectroscopy

Monday, 20 May 2019 17:42 (20 minutes)

Presenter:  PACHMAYER, Yvonne Chiara (Ruprecht Karls Universitaet Heidelberg (DE))

Session Classification:  Plenary I
Searches for heavy resonances (w and w/o jet substructure; including Z’, W’, dijets, dibosons)

Tuesday, 21 May 2019 09:24 (20 minutes)

Presenter: NGADIUBA, Jennifer (CERN)
Session Classification: Plenary II
Searches for new heavy particles (including vector-like quarks, leptoquarks)

Tuesday, 21 May 2019 09:48 (20 minutes)

Presenter: ERBACHER, Robin (University of California Davis (US))

Session Classification: Plenary II
Searches for long-lived particles and other unconventional signatures (incl heavy neutral leptons, dark photon searches, H->4 leptons via Z\_dark, etc.)

*Tuesday, 21 May 2019 10:12 (20 minutes)*

**Presenter:** BORSATO, Martino (Ruprecht Karls Universitaet Heidelberg (DE))

**Session Classification:** Plenary II
Searches for dark matter

Tuesday, 21 May 2019 10:36 (20 minutes)

Presenter: HSU, Shih-Chieh (University of Washington Seattle (US))
Session Classification: Plenary II
Theory talk (novel searches for new physics that have not been done before, new interpretations of current searches, emphasis on searches that become interesting with the full LHC Run 2 dataset and/or with the Run 3 dataset...)

Presenter: TAIT, Tim M.P. (University of California, Irvine)
Session Classification: Plenary II
Recent progress in PDF fits using LHC data

Tuesday, 21 May 2019 16:30 (20 minutes)

Presenter: FORTE, Stefano (Università degli Studi e INFN Milano (IT))
Session Classification: Plenary III
State of the art calculations for top, Higgs and jet production (includes MC)

Tuesday, 21 May 2019 16:54 (20 minutes)

Presenter: BONCIANI, Roberto (Dipartimento di Fisica)
Session Classification: Plenary III
Production of top quarks, jets and photons

Tuesday, 21 May 2019 17:18 (20 minutes)

Presenter: LLORENTE MERINO, Javier (Chinese Academy of Sciences (CN))
Session Classification: Plenary III
Jet substructure and W/Z and top production in association with jets and heavy flavour

Tuesday, 21 May 2019 17:42 (20 minutes)

Presenter: POLLARD, Chris (Deutsches Elektronen-Synchrotron (DE))
Session Classification: Plenary III
Total cross-section and particle production in soft and hard processes at the LHC

Tuesday, 21 May 2019 18:06 (20 minutes)

Presenter: ROYON, Christophe (The University of Kansas (US))
Session Classification: Plenary III
Thermalization, hydrodynamization, and kinetic theory in the strong interaction

Wednesday, 22 May 2019 09:00 (20 minutes)

Presenter: TEANEY, Derek (Stony Brook University)

Session Classification: Plenary IV
Particle production vs. multiplicity and flow-like effects in small systems

Wednesday, 22 May 2019 09:24 (20 minutes)

Presenter: ORTIZ VELASQUEZ, Antonio (Universidad Nacional Autonoma (MX))
Session Classification: Plenary IV
Contribution ID: 136

**Hard probes (energy loss, jets, gamma/W/Z-jet, jet substructure)**

*Wednesday, 22 May 2019 09:48 (20 minutes)*

**Presenter:** EVDOKIMOV, Olga (University of Illinois at Chicago (US))

**Session Classification:** Plenary IV
Open and hidden heavy-flavor production and flow

*Wednesday, 22 May 2019 10:12 (20 minutes)*

**Presenter:** Dr DA SILVA, Cesar Luiz (Los Alamos National Lab)

**Session Classification:** Plenary IV
Probes of hadronization (resonances, (hyper)nuclei, charm baryons, coalescence)

Wednesday, 22 May 2019 10:36 (20 minutes)

Presenter: LEA, Ramona (Universita e INFN Trieste (IT))
Session Classification: Plenary IV
Production of single top and of top quark pair in association with W/Z, gamma

Thursday, 23 May 2019 09:00 (20 minutes)

Presenter: MCCARTHY, Thomas (Max-Planck-Institut für Physik (DE))
Session Classification: Plenary V
Top properties: mass, spin correlation and polarisation

Thursday, 23 May 2019 09:24 (20 minutes)

**Presenter:** YUMICEVA, Francisco (Florida Institute of Technology (US))

**Session Classification:** Plenary V
Precision electroweak (include W mass and electroweak angle and prospects)

Thursday, 23 May 2019 09:48 (20 minutes)

Presenter: ZANZI, Daniele (CERN)
Session Classification: Plenary V
Precision SM calculations including QCD, QCD-EW and EW corrections

Thursday, 23 May 2019 10:12 (20 minutes)

Presenter: MELNIKOV, Kirill (Karlsruhe Institute of Technology, Germany)
Session Classification: Plenary V
Theoretical systematics in the W boson mass determination and comments on the top mass measurement

*Thursday, 23 May 2019 10:36 (20 minutes)*

**Presenter:** VICINI, Alessandro

**Session Classification:** Plenary V
Phenomenology of Higgs physics (theory, broad talk incl. BSM)

Thursday, 23 May 2019 16:30 (20 minutes)

Presenter: REINA, Laura (Florida State University (US))

Session Classification: Plenary VI
Higgs couplings & properties (ATLAS+CMS)

Thursday, 23 May 2019 16:54 (20 minutes)

Presenter: CADAMURO, Luca (University of Florida (US))
Session Classification: Plenary VI
Differential Higgs (ew interpretation) and diboson cross sections (ATLAS+CMS)

Thursday, 23 May 2019 17:18 (20 minutes)

Presenter:  ADELMAN, Jahred (Northern Illinois University)

Session Classification:  Plenary VI
Rare and exotic Higgs decays, incl. new scalars
(ATLAS+CMS)

Thursday, 23 May 2019 17:42 (20 minutes)

Presenter: FINCO, Linda (University of Nebraska Lincoln (US))

Session Classification: Plenary VI
Contribution ID: 148

**VBS & di-Higgs, including prospects (ATLAS+CMS)**

*Thursday, 23 May 2019 18:06 (20 minutes)*

**Presenter:** SUN, Xiaohu (University of Alberta (CA))

**Session Classification:** Plenary VI
Global fits of the SM parameters

Friday, 24 May 2019 09:00 (20 minutes)

Presenter: ERLER, Jens (IF-UNAM)
Session Classification: Plenary VII
Studies of rare top processes: tZ, tγ, 4-top, FCNC, anomalous couplings

Friday, 24 May 2019 09:23 (20 minutes)

Presenter: MORENO LLACER, Maria (CERN)
Session Classification: Plenary VII
Studies of rare EW processes at the LHC Diboson and Triboson production (including prospects)

Friday, 24 May 2019 09:46 (20 minutes)

Presenter:  CHANG, Philip (Univ. of California San Diego (US))
Session Classification:  Plenary VII
Precise predictions for rare processes involving Top-Quarks and their phenomenological implications.

Friday, 24 May 2019 10:09 (20 minutes)

**Presenter:**  PAGANI, Davide (TUM - Garching bei München)

**Session Classification:**  Plenary VII
Organised discussion on LHC sensitivity with EFT

Friday, 24 May 2019 10:36 (24 minutes)

Presenters: DE BLAS, Jorge (INFN-Padova); SCHULZ, Markus (CERN)

Session Classification: EFT discussion
Strong SUSY production

Friday, 24 May 2019 16:45 (20 minutes)

Presenter: MARTIN DIT LATOUR, Bertrand (University of Bergen (NO))

Session Classification: Plenary VIII
Electroweak SUSY production

Friday, 24 May 2019 17:09 (20 minutes)

Presenter:  ZAMBITO, Stefano (Harvard University (US))
Session Classification:  Plenary VIII
3rd generation

Friday, 24 May 2019 17:33 (20 minutes)

Presenter: SUAREZ, Indara (Boston University (US))
Session Classification: Plenary VIII
Contribution ID: 157

**RPV + stealth SUSY (LLP + unconv. signatures in plenary VIII)**

*Friday, 24 May 2019 17:57 (20 minutes)*

**Presenter:** MEI, Kelvin (Princeton University)

**Session Classification:** Plenary VIII
SUSY theory (broad aspects of SUSY relevant to full Run 2 and upcoming Run 3 data; areas of opportunity)

Friday, 24 May 2019 18:21 (20 minutes)

**Presenter:** WAGNER, Carlos E.M. (University of Chicago)

**Session Classification:** Plenary VIII
plans and prospects for flavor physics at LHC

Saturday, 25 May 2019 09:22 (17 minutes)

Presenter:  POLCI, Francesco (Centre National de la Recherche Scientifique (FR))
Session Classification:  Plenary IX
future upgrades at ATLAS+CMS (possibly focused on timing detectors, trigger and software)

Saturday, 25 May 2019 09:43 (17 minutes)

**Presenter:** REKOVIC, Vladimir (Vinca, University of Belgrade (RS)/ CERN / Florida (US))

**Session Classification:** Plenary IX
physics projections from ATLAS+CMS with upgraded detectors

Saturday, 25 May 2019 10:04 (17 minutes)

**Presenter:** NACHMAN, Ben (Lawrence Berkeley National Lab. (US))

**Session Classification:** Plenary IX
Future colliders: design challenges and physics drivers

Saturday, 25 May 2019 10:25 (17 minutes)

Presenter: WULZER, Andrea (CERN and EPFL)
Session Classification: Plenary IX
Contribution ID: 164

Type: Talk

IAC report

Saturday, 25 May 2019 11:30 (10 minutes)

Presenter: NISATI, Aleandro (Sapienza Universita e INFN, Roma I (IT))

Session Classification: Closing Plenary
Indirect Searches for GeV-TeV Dark Matter with Cosmic Ray and Gamma Ray Observations

Saturday, 25 May 2019 11:40 (40 minutes)

Presenter:  Sandoval, Andres (Johann-Wolfgang-Goethe Univ. (DE))

Session Classification:  Closing Plenary
Experimental Review

Saturday, 25 May 2019 12:20 (40 minutes)

**Presenter:** KONIGSBERG, Jacobo (University of Florida (US))

**Session Classification:** Closing Plenary
Theory Vision

Saturday, 25 May 2019 13:00 (40 minutes)

**Presenter:** CRAIG, Nathaniel (UC Santa Barbara)

**Session Classification:** Closing Plenary
Closing Remarks

Saturday, 25 May 2019 13:40 (10 minutes)

Presenters:  OLSEN, Jim (Princeton University (US)); MANSOULIE, Bruno (Université Paris-Saclay (FR))

Session Classification:  Closing Plenary
Contributions ID: 169

Type: Talk

Opening Remarks

Monday, 20 May 2019 09:00 (25 minutes)

Session Classification: Opening Plenary
CERN overview

Monday, 20 May 2019 09:25 (30 minutes)

Presenter: KRAMMER, Manfred (CERN)
Session Classification: Opening Plenary
LHC overview

Monday, 20 May 2019 09:55 (25 minutes)

Presenter: IADAROLA, Giovanni (CERN)
Session Classification: Opening Plenary
CMS overview

Monday, 20 May 2019 10:20 (25 minutes)

Presenter: MALGERI, Luca (CERN)

Session Classification: Opening Plenary
Contribution ID: 173

Type: Talk

ATLAS overview

Monday, 20 May 2019 11:15 (25 minutes)

Presenter: EINSWEILER, Kevin Frank (Lawrence Berkeley National Lab. (US))

Session Classification: Opening Plenary
ALICE overview

Monday, 20 May 2019 11:40 (25 minutes)

Presenter: KLEIN, Jochen (Università e INFN Torino (IT))
Session Classification: Opening Plenary
LHCb overview

Monday, 20 May 2019 12:05 (25 minutes)

Presenter: PASSALEVA, Giovanni (INFN Florence (IT))
Session Classification: Opening Plenary
Going Beyond the Standard Model at the LHC with Dedicated Detectors

The search for physics beyond the Standard Model using dedicated accelerator experiments is presented. The aim of these experiments is to extend the physics reach of the ATLAS and CMS detectors at the LHC in a largely complementary way. As such they represent an important extension of the discovery frontier of particle physics. I shall present the results of the MoEDAL-LHC experiment, that is the only such collider experiment currently operating, as well as MoEDAL’s plans for RUN-3 that involve the installation of the MAPP detector (MoEDAL Apparatus for Penetrating Particles). Also, I shall briefly mention the aims and status of the planned dedicated LHC experiments: milliQan, CODEX-b, MATHUSLA, FASER and AL3X.

Primary author: PINFOLD, James (University of Alberta (CA))
Presenter: PINFOLD, James (University of Alberta (CA))
Session Classification: Parallel Exotica
Track Classification: Exotics
DEPENDENCE OF THE $Z$-PRODUCTION VIA $ep$-DIS ON THE IDENTIFICATION OF THE PARAMETER $f_q(x', \tilde{Q}^2)$ INVOLVED IN THE QUARK DISTRIBUTION FUNCTIONS

We discuss $Z$-production in Deep Inelastic Scattering $e+p \rightarrow e+Z+X$ using the Parton Model, in the context of the Standard Model. In contrast to the deep inelastic $ep$-scattering ($e+p \rightarrow e+X$), where $Q^2$ the transferred momentum square is unique in the case of boson production it depends upon the mechanism involved, that it is related to the EW interaction. We argue that the kinematics of the process and the usual criterion for $\tilde{Q}^2$, lead to a simple and practical prescription to calculate $Z$-production via $ep$–DIS. We present estimates for the total cross section as a function of $\sqrt{s}$, taking the energy of the $ep$ system in the range $300 \leq \sqrt{s} \leq 1.3$ TeV, and also for different assignments of $Q^2$. We added non-leading contribution by using the CalcHEP program.

**Primary authors:** Dr ROSADO, Alfonso; Dr ROSADO-NAVARRO, Sebastián (Fac. de Cs. Físico-Matemáticas)

**Presenters:** Dr ROSADO, Alfonso; Dr ROSADO-NAVARRO, Sebastián (Fac. de Cs. Físico-Matemáticas)

**Session Classification:** Poster session

**Track Classification:** QCD
A simple explanation to the strong suppression of fermionic EFT operators

The present approach relies on the SM chiral symmetry breaking pattern $SU(2)_L \otimes SU(2)_R \rightarrow SU(2)_{L+R}$, with the EW Goldstone bosons given in a non-linear realization and the Higgs boson described by an EW singlet field. In addition, we assume the presence of new physics heavy states around the TeV scale that do not couple to the SM fermions, only to the SM bosonic sector. However, the mixing between gauge bosons and BSM resonances induces a small indirect interaction between the BSM sector and the SM fermions. This leads to an important suppression of the fermionic operators in the low-energy EW effective theory (bilinear and four-fermion operators) in comparison with the purely bosonic ones. This naturally explains the strong experimental bounds on fermionic operators and why these resonances could not be yet detected: even if energies of the order of the TeV can be reached in present and future accelerators, their production from initial SM fermions yields a very small cross section because of this suppression mechanism. On the other hand, they can leave an imprint in SM boson measurements accessible to future experimental runs (e.g., the oblique $S$ parameter). Finally, we compare our results with constraints from collider data.

**Primary authors:** Dr GUEVARA, Adolfo (Madrid University); Mr ALVARADO, Fernando (Madrid University); SANZ-CILLERO, Juan José (Universidad Complutense de Madrid)

**Presenter:** Dr GUEVARA, Adolfo (Madrid University)

**Session Classification:** Poster session

**Track Classification:** Electroweak
Simulation studies of the impact of the CMS radiation environment on RPC detectors

The High-Luminosity Large Hadron Collider (HL-LHC) upgrade aims to increase its luminosity by a factor of 5 beyond the LHC’s design value and the integrated luminosity by a factor of 10, increasing the potential for discoveries after 2025. The increased collision rate of particles will be a challenge for the CMS systems as higher levels of radiation could degrade them and affect their performance. It is therefore important to understand the expected radiation environment and its impact on the different sub-detectors. In this study we use the FLUKA simulation to reproduce the radiation environment during CMS Run-2 and the GEANT4 simulation to estimate its impact on the RPC detectors. Results are compared with measurements collected by the RPC system during 2018 and reasonable agreement is observed. This study serves as a benchmark for future simulations with a Phase-2 (HL-LHC) configuration.

Primary author: URIBE ESTRADA, Cecilia (Autonomous University of Puebla (MX))

Presenter: URIBE ESTRADA, Cecilia (Autonomous University of Puebla (MX))

Session Classification: Poster session

Track Classification: Upgrade
Flavor from the double tetrahedral group without supersymmetry: flavorful axions and neutrinos

We extend the work of Carone, Chaurasia and Vasquez on non-supersymmetric models of flavor based on the double tetrahedral group. Three issues are addressed: (1) the sector of flavorsymmetry-breaking fields is simplified and their potential studied explicitly, (2) a flavorful axion is introduced to solve the strong CP problem and (3) the model is extended to include the neutrino sector. We show how the model can accommodate the strong hierarchies manifest in the charged fermion Yukawa matrices, while predicting a qualitatively different form for the light neutrino mass matrix that is consistent with observed neutrino mass squared differences and mixing angles.

Primary authors: CARONE, Christopher; MERCHAND, Marco

Presenter: MERCHAND, Marco

Track Classification: Electroweak
Outreach in Mexico: CMS masterclasses, International Cosmic Day & International Muon Week

Since 2014 several outreach activities have been performed together with IPPOG, Quarknet and DESY programs. We started in Mexico city in 2014 with a workshop with high school teachers and later working with their students. This year the activities have reached five cities in five different Mexican states and are continuing to grow. In 2018 a collaboration with the University of Notre Dame (COSMICA: CMS Outreach and Science for Masterclass Institutes Collaborating in the Americas) helped us consolidate our relationship with them and expand our outreach participation. A summary of the activities will be presented.

Primary authors: CARRILLO MORENO, Salvador (Universidad Iberoamericana (MX)); VAZQUEZ VALEN CIA, Elsa Fabiola (Universidad Iberoamericana (MX)); CECIRE, Kenneth William (University of Notre Dame (US)); WEGNER, Jeremy (Winamac Community High School)

Co-authors: WAYNE, Mitchell Ross (University of Notre Dame (US)); HILDRETH, Mike (University of Notre Dame (US)); RODRIGUEZ, Jeff (University of Cincinnati); OROPEZA BARRERA, Cristina (Universidad Iberoamericana (MX)); URIBE ESTRADA, Cecilia (Autonomous University of Puebla (MX)); RAMIREZ GUADARRAMA, Dalia Lucero (Universidad Iberoamericana)

Presenter: CARRILLO MORENO, Salvador (Universidad Iberoamericana (MX))

Session Classification: Poster session

Track Classification: Outreach
Exotic decay of the Higgs boson to a pair of light pseudoscalars in the CMS experiment

The Standard Model is one of the most successful theories at describing the strong, weak, and electromagnetic forces and the interactions between the elementary particles.

The scalar boson discovered in 2012 at the Large Hadron Collider (LHC) might be consistent with the Higgs boson predicted by the Standard Model, thus validating the Higgs mechanism and therefore representing a further confirmation of this theoretical framework. However, the experimental data still leave plenty of room to determine whether or not an extension of the scalar sector is allowed.

The LHC combination of the SM Higgs boson measurements at 7 and 8 TeV allows Higgs boson decays to BSM states with a rate of up to 34% at 95% confidence level.

Presence of new physics within the context of the Two-Higgs-Double-Model and NMSSM theories allows the exotic decay of the Higgs boson into a pair of light pseudoscalars. CMS collaboration has searched for this exotic decay of the Higgs boson in the dataset collected at 13 TeV in different final states. In this contribution, the search in the mumubb final state is reviewed and the results are summarized.

Primary author: BAKHSHIANSOHI, Hamed (DESY)
Presenter: BAKHSHIANSOHI, Hamed (DESY)
Session Classification: Poster session
Track Classification: Higgs
Preliminary studies on GEM foil degradation in harsh radiation environments

Several High Energy Physics experiments are adopting Gaseous Electron Multipliers (GEMs) in substitution for the Multi-Wire Proportional Counters (MWPC) either in upgrade plans or in the design stage. The ALICE experiment, for instance, is passing through upgrades that, among other goals, aim the replacement of the MWPC at the readout planes of its Time Projection Chamber (TPC) by a stack of four GEMs. By this replacement, achieving a higher count rate capability and no need for the gate mode of operation are the ultimate goals. The count rate enhancement of the TPC together with the Inner Tracking System (ITS) upgrade shall increase the ALICE efficiency for particle identification drastically. Another example is the upgrade of the CMS experiment where GEM are replacing the MWPC at the Muon chamber end caps. Improvements in the maximum limit of count rate and in the Higher Level Trigger are expected by adopting a stack of three GEM-foils. Because of all this interest on GEMs for high count rates measurements, it is important to evaluate the degradation of its constituent materials under such circumstances. This work aims to bring insights from material science to that matter. For this, we studied two possible effects that may play some role in the degradation process of the GEM foils in a harsh radiation environment: One of them is the Kapton degradation due to energy deposition by ionization, which is an effect expected to be triggered by highly energetic particles. We degraded a Kapton foil using 2.2 MeV He+ ions.

At this energy, the electronic stopping dominates the interaction processes, thus depositing energy by sequences of ionization. The Kapton composition was assessed by real-time nuclear scattering spectrometry, revealing the Hydrogen losses as the major effect. The second process considered in this study is the erosion of the Copper clad. Opposite to the Kapton degradation, the Copper clad erosion is expected to be induced by low energy ions associated with a sputtering process of the Copper. These low energy ions are expected to be generated during the avalanche of ionization in the amplification process. This effect was explored by computer simulation using the Garfield++ library and estimates of sputtering yields.

Primary authors: Prof. SILVA, Tiago (University of São Paulo); BREGANT, Marco (Universidade de São Paulo (BR)); Mr GROSSI ARAUJO DE SOUZA, Geovane (Universidade de Sao Paulo (BR)); JAHNKE, Cristiane (Technische Universität München (DE)); GAMEIRO MUNHOZ, Marcelo (Universidade de São Paulo (BR))

Presenter: Prof. SILVA, Tiago (University of São Paulo)

Session Classification: Poster session

Track Classification: Upgrade
Study of the Global temperature fluctuations in pp collisions at LHC energies

Fluctuations may arise from initial state fluctuations and thermodynamical fluctuations, as temperature fluctuations which is an important quantity that allows to probe the fluctuations at early stages of the reaction and to understand QCD transition order for small collision systems. A large number of particles produced at high multiplicity events on pp collisions where signals of collectivity have been found allows to construct the pT spectra for every event and to obtain an effective temperature for each event and study its properties. We show a study for event-by-event basis Global Temperature fluctuations on pp collisions at high multiplicities for LHC energies in terms of the production of color sources.

Primary authors: Mr LOZA, Edgar (Universidad de Guadalajara); Mrs BAUTISTA, Irais (Benemérita Universidad de Autónoma de Puebla)

Presenters: Mr LOZA, Edgar (Universidad de Guadalajara); LOZA RAMÍREZ, Edgar Mauricio (Universidad de Guadalajara)

Session Classification: Poster session

Track Classification: Heavy Ions
Electroweak precision measurements with ATLAS

Tuesday, 21 May 2019 14:30 (16 minutes)

**Presenter:** YATSENKO, Elena (Shanghai Jiao Tong University (CN) & Tsung-Dao Lee Institute (CN))

**Session Classification:** Parallel EWK
Electroweak precision measurements with CMS

Tuesday, 21 May 2019 14:52 (16 minutes)

Presenter: HSU, Dylan George (Massachusetts Inst. of Technology (US))
Session Classification: Parallel EWK
Drell-Yan modelling for precision physics

Tuesday, 21 May 2019 15:14 (16 minutes)

Presenter: PICCININI, Fulvio (Universita and INFN (IT))
Session Classification: Parallel EWK
PDFs for precision measurements

Tuesday, 21 May 2019 15:36 (16 minutes)

Presenter: FORTE, Stefano (Università degli Studi e INFN Milano (IT))

Session Classification: Parallel EWK
Prompt photons from gluon fusion/splitting induced by magnetic fields in heavy-ion collisions

*Thursday, 23 May 2019 14:30 (22 minutes)*

**Presenters:** Prof. AYALA, Alejandro (Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de Mexico); AYALA SANTANDER, Alejandro (Federico Santa Maria Technical University (CL))

**Session Classification:** Joint Parallel EW/HI
Low-mass dielectron measurements in pp, p-Pb and Pb-Pb with ALICE

Thursday, 23 May 2019 14:52 (22 minutes)

Presenter: LEHNER, Sebastian (Austrian Academy of Sciences (AT))

Session Classification: Joint Parallel EW/HI
Electroweak boson measurements in p-Pb and Pb-Pb collisions with CMS

Thursday, 23 May 2019 15:14 (22 minutes)

Presenter:  BI, Ran (Massachusetts Inst. of Technology (US))
Session Classification:  Joint Parallel EW/HI
Electroweak boson measurements in p-Pb and Pb-Pb collisions with ATLAS

Thursday, 23 May 2019 15:36 (22 minutes)

Presenter:  KREMER, Jakub (AGH University of Science and Technology (PL))
Session Classification:  Joint Parallel EW/HI
Higher-order and mixed QCD-QED corrections for Drell-Yan

Friday, 24 May 2019 11:30 (16 minutes)

Presenter: SBORLINI, German (Università di Milano, INFN Milano and IFIC-Valencia)
Session Classification: Parallel EWK
Recent diboson and multiboson results with ATLAS

*Friday, 24 May 2019 11:52 (16 minutes)*

**Presenter:** CRISTINZIANI, Markus (University of Bonn (DE))

**Session Classification:** Parallel EWK
Recent diboson and multiboson results with CMS

Friday, 24 May 2019 12:14 (16 minutes)

Presenter:  HUSSAIN, Usama (University of Wisconsin Madison (US))
Session Classification:  Parallel EWK
BSM interpretations of multi-boson measurements

 Presenter:  RIEMBAU, Marc (Universite de Geneve (CH))
 Session Classification:  Parallel EWK
Electroweak production of vector bosons (VBS & VBF) with ATLAS

Friday, 24 May 2019 14:30 (20 minutes)

Presenter: POTAMIANOS, Karolos (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Parallel EWK
Electroweak production of vector bosons (VBS & VBF) with CMS

Friday, 24 May 2019 14:55 (20 minutes)

Presenter:  BELLAN, Riccardo (Universita e INFN Torino (IT))

Session Classification:  Parallel EWK
Precise predictions for VBS/VBF production

Friday, 24 May 2019 15:20 (20 minutes)

Presenters: KARLBERG, Alexander (University of Copenhagen (DK)); Dr KARLBERG, Alexander (Universitaet Zuereich (CH))

Session Classification: Parallel EWK
Searches for heavy diboson resonances with ATLAS

Presenter: ILIC, Nikolina (Nikhef National institute for subatomic physics (NL))
Session Classification: Parallel Exotica
Searches for hadronic resonances in CMS

**Presenter:**  YU, David (Brown University (US))

**Session Classification:**  Parallel Exotica
Searches for new physics in events with top pairs in ATLAS

**Presenter:** NACKENHORST, Olaf (Technische Universitaet Dortmund (DE))

**Session Classification:** Parallel Exotica
Recent developments in machine learning algorithms applied to HEP searches

**Presenter:**  KAGAN, Michael Aaron (SLAC National Accelerator Laboratory (US))

**Session Classification:** Parallel Exotica
Contribution ID: 204  
Type: not specified

Discussion

Session Classification: Parallel Exotica
Searches for heavy diboson resonances with ATLAS

Tuesday, 21 May 2019 14:30 (20 minutes)

Presenter: ILIC, Nikolina (Nikhef National institute for subatomic physics (NL))

Session Classification: Parallel Exotica
Searches for hadronic resonances in CMS

Tuesday, 21 May 2019 14:50 (20 minutes)

Presenter: YU, David (Brown University (US))
Session Classification: Parallel Exotica
Searches for new physics in events with top pairs in ATLAS

Tuesday, 21 May 2019 15:10 (20 minutes)

Presenter: NACKENHORST, Olaf (Technische Universitaet Dortmund (DE))

Session Classification: Parallel Exotica
Recent developments in machine learning algorithms applied to HEP searches

*Tuesday, 21 May 2019 15:30 (20 minutes)*

**Presenter:** KAGAN, Michael Aaron (SLAC National Accelerator Laboratory (US))

**Session Classification:** Parallel Exotica
Contribution ID: 209

Type: not specified

Discussion

Tuesday, 21 May 2019 15:50 (10 minutes)

Session Classification: Parallel Exotica
WIMPs and beyond

Thursday, 23 May 2019 11:30 (20 minutes)

Presenter: GOUDELIS, Andreas (LPTHE - Paris)
Session Classification: Parallel Exotica
Recent results on searches for Dark Matter in ATLAS

Thursday, 23 May 2019 11:50 (20 minutes)

Presenter: KALDERON, William (Lund University (SE))

Session Classification: Parallel Exotica
Recent results on searches for Dark Matter in CMS

Thursday, 23 May 2019 12:10 (20 minutes)

Presenter: REINSVOLD HALL, Allison (Fermilab)
Session Classification: Parallel Exotica
Searches for high-mass resonances in events with leptons in ATLAS+CMS

Thursday, 23 May 2019 12:30 (20 minutes)

Presenter: TAL HOD, Noam (Weizmann Institute of Science (IL))

Session Classification: Parallel Exotica
Discussion

Thursday, 23 May 2019 12:50 (10 minutes)

Presenters:  ACCOMANDO, Elena (Southampton University);  ACCOMANDO, Elena (Universita e INFN (IT));  PANDOLFI, Francesco (INFN Rome)

Session Classification:  Parallel Exotica
Dark sector models

Monday, 20 May 2019 14:30 (17 minutes)

Presenter: FOLDENAUER, Patrick
Session Classification: Parallel Exotica
Searches for Dark Photons in LHCb

Monday, 20 May 2019 14:50 (17 minutes)

Presenter: CASAIS VIDAL, Adrian (Instituto Galego de Física de Altas Enerxías (ES))
Session Classification: Parallel Exotica
Dark sector searches in CMS

Monday, 20 May 2019 15:10 (17 minutes)

Presenter: DUARTE, Javier Mauricio (Fermi National Accelerator Lab. (US))

Session Classification: Parallel Exotica
Dark sector searches in NA62, Belle-II, BaBar, and other non-LHC experiments

Monday, 20 May 2019 15:30 (17 minutes)

Presenters: ENGELFRIED, Jurgen (Instituto de Fisica, Universidad Autonoma de San Luis Potosi, Mexico); ENGELFRIED, Jurgen (Univ. Autonoma de San Luis Potosi (MX))

Session Classification: Parallel Exotica
Contribution ID: 219  Type: not specified

Discussion

Monday, 20 May 2019 15:50 (10 minutes)

Presenters: ACCOMANDO, Elena (Southampton University); ACCOMANDO, Elena (Universita e INFN (IT)); BORSATO, Martino (Ruprecht Karls Universitaet Heidelberg (DE))

Session Classification: Parallel Exotica
Measurements of $ttH$ and $tH$ production at ATLAS + CMS

Monday, 20 May 2019 14:30 (12 minutes)

Presenter: KELLER, John Stakely (Carleton University (CA))

Session Classification: Parallel Higgs
Higgs production in the VH mode at ATLAS+CMS

Monday, 20 May 2019 14:45 (12 minutes)

Presenter:  Dr MASTROLORENZO, Luca (Rheinisch Westfaelische Tech. Hoch. (DE))
Session Classification:  Parallel Higgs
Couplings and properties measurements with fermionic Higgs decays and searches for second/first generation decays at the LHC

Monday, 20 May 2019 15:00 (12 minutes)

Presenter: SPANRING, Markus (Austrian Academy of Sciences (AT))
Session Classification: Parallel Higgs
Couplings and properties measurements
(Spin/Parity, mass and width) with ATLAS + CMS in bosonic Higgs decay modes

Monday, 20 May 2019 15:15 (12 minutes)

Presenter: YANG, Hongtao (Lawrence Berkeley National Lab. (US))
Session Classification: Parallel Higgs
Latest progress on SM calculations for Higgs processes

Monday, 20 May 2019 15:30 (12 minutes)

Presenter:  MISTLBERGER, Bernhard (Massachusetts Inst. of Technology (US))
Session Classification:  Parallel Higgs
Discussion

*Monday, 20 May 2019 15:45 (15 minutes)*

**Presenters:** DE BLAS, Jorge (INFN-Padova); KUNA, Marine (Université Grenoble Alpes, LPSC); WAR-DLE, Nicholas (Imperial College (GB))

**Session Classification:** Parallel Higgs
Progress in MC tools for Higgs physics

Tuesday, 21 May 2019 11:30 (15 minutes)

Presenter:  RE, Emanuele (CERN)
Session Classification:  Parallel Higgs
Importance of differential distributions in Higgs physics

Tuesday, 21 May 2019 11:48 (15 minutes)

Presenter:  GONÇALVES, Dorival (University of Pittsburgh)

Session Classification:  Parallel Higgs
Differential measurements of Higgs production at ATLAS and CMS

Tuesday, 21 May 2019 12:06 (15 minutes)

Session Classification: Parallel Higgs
Status and prospects of STXS measurements in ATLAS and CMS

Tuesday, 21 May 2019 12:24 (15 minutes)

Presenter: KATO, Chikuma (Tsung-Dao Lee Institute (CN))
Session Classification: Parallel Higgs
Discussion

Tuesday, 21 May 2019 12:42 (18 minutes)

Presenters: DE BLAS, Jorge (INFN-Padova); KUNA, Marine (Université Grenoble Alpes, LPSC); WAR-DLE, Nicholas (Imperial College (GB))

Session Classification: Parallel Higgs
Searches for Higgs to invisible and other exotic/non-standard decays at ATLAS and CMS

Presenter: DELANNOY SOTOMAYOR, Andres Guillermo (University of Tennessee (US))

Session Classification: Parallel Higgs
Searches for non-resonant double Higgs production and future projections at the (HL-)LHC

Presenter: READIOFF, Nathan Peter (LPSC-Grenoble, CNRS/UGA (FR))

Session Classification: Parallel Higgs
Searches for charged Higgs bosons at the LHC

Presenter: EYSERMANS, Jan (Autonomous University of Puebla (MX))
Session Classification: Parallel Higgs
Direct searches for additional scalar Higgs at ATLAS + CMS

**Presenter:** PALACINO, Gabriel (Indiana University (US))

**Session Classification:** Parallel Higgs
Constraints on extended Higgs sectors at the LHC

Presenter: ROBENS, Tania Natalie (Rudjer Boskovic Institute (HR))
Session Classification: Parallel Higgs
Contribution ID: 236
Type: not specified

Discussion

Presenters: DE BLAS, Jorge (INFN-Padova); KUNA, Marine (Université Grenoble Alpes, LPSC); WAR-DLE, Nicholas (Imperial College (GB))

Session Classification: Parallel Higgs
EW measurements at HL-LHC

Thursday, 23 May 2019 14:30 (15 minutes)

**Presenter:** SAVIN, Alexander (University of Wisconsin Madison (US))

**Session Classification:** Parallel UPG/FUT
Higgs measurements at HL-LHC

Thursday, 23 May 2019 14:48 (15 minutes)

Presenter: BENITEZ, Jose Feliciano (Universidad de Sonora (MX))

Session Classification: Parallel UPG/FUT
LHCb Upgrade I

Thursday, 23 May 2019 15:42 (15 minutes)

Presenter: BELLEE, Violaine (EPFL - Ecole Polytechnique Federale Lausanne (CH))

Session Classification: Parallel UPG/FUT
ALICE LS2 Upgrade – Commissioning & Physics Projection

Thursday, 23 May 2019 15:24 (15 minutes)

Presenter: NORMAN, Jaime (Centre National de la Recherche Scientifique (FR))
Session Classification: Parallel UPG/FUT
ATLAS inner tracker design for Phase-2

Friday, 24 May 2019 11:30 (13 minutes)

Presenter: READIOFF, Nathan Peter (LPSC-Grenoble, CNRS/UGA (FR))
Session Classification: Parallel UPG/FUT
ALICE LS3 Upgrade – A fully cylindrical Inner Tracking System

Friday, 24 May 2019 11:48 (13 minutes)

Presenter: KEIL, Markus (CERN)
Session Classification: Parallel UPG/FUT
ATLAS timing detectors in Phase-2

Session Classification: Parallel UPG/FUT
CMS timing detectors in Phase-2

Friday, 24 May 2019 12:06 (13 minutes)

Presenter:  PANDOLFI, Francesco (INFN Rome)
Session Classification:  Parallel UPG/FUT
Future LHCb Upgrades

Friday, 24 May 2019 12:24 (13 minutes)

Presenters: DA SILVA, Cesar Luiz (Los Alamos National Laboratory (US)); PAIS, Preema Rennee (EPFL - Ecole Polytechnique Federale Lausanne (CH))

Session Classification: Parallel UPG/FUT
CMS trigger in Phase-2

Friday, 24 May 2019 12:42 (13 minutes)

Presenter: FREER, Chad Wells (Northeastern University (US))
Session Classification: Parallel UPG/FUT
New LHC experiments (Milliqan, FASER, ...)

Friday, 24 May 2019 14:30 (15 minutes)

**Presenter:** MILLER, David (University of Chicago (US))

**Session Classification:** Parallel UPG/FUT
ALICE Forward Calorimeter (FOCAL) – Detector design and physics reach

Friday, 24 May 2019 14:48 (15 minutes)

Presenter: NOVITZKY, Norbert (University of Tsukuba (JP))
Session Classification: Parallel UPG/FUT
FCC-hh/ee

Friday, 24 May 2019 15:06 (15 minutes)

Presenters: SELVAGGI, Michele (CERN); GIACOMELLI, Paolo (Universita e INFN, Bologna (IT))

Session Classification: Parallel UPG/FUT
**Contributor ID:** 251  
**Type:** Talk  

**SppC/CEPC**  
*Friday, 24 May 2019 15:24 (15 minutes)*

**Presenter:** GIACOMELLI, Paolo (Universita e INFN, Bologna (IT))

**Session Classification:** Parallel UPG/FUT
Physics perspective of future lepton colliders

Friday, 24 May 2019 15:42 (15 minutes)

Presenter: DE BLAS, Jorge (INFN-Padova)
Session Classification: Parallel UPG/FUT
State-of-the-art precision calculations for top quark production and decay

Wednesday, 22 May 2019 11:30 (20 minutes)

Presenter: PONCELET, Rene (Cambridge University)
Session Classification: Parallel Top
Latest ATLAS measurements of inclusive and differential top quark pair production

Wednesday, 22 May 2019 12:00 (12 minutes)

Presenter: MIJOVIC, Liza (University of Edinburgh)
Session Classification: Parallel Top
Latest CMS measurements of inclusive and differential top quark pair production

*Wednesday, 22 May 2019 12:15 (12 minutes)*

**Presenter:** MIKUNI, Vinicius Massami (Universitaet Zuerich (CH))

**Session Classification:** Parallel Top
Latest results on top quark properties, inc. mass and spin correlation @ ATLAS

Wednesday, 22 May 2019 12:30 (12 minutes)

Presenter: CRISTINZIANI, Markus (University of Bonn (DE))

Session Classification: Parallel Top
Latest results on top quark properties, inc. mass and spin correlation @ CMS

Wednesday, 22 May 2019 12:45 (15 minutes)

Presenter: NEGRO, Giulia (Purdue University (US))

Session Classification: Parallel Top
MUON Spectrometry at forward rapidities with ALICE

Monday, 20 May 2019 14:30 (20 minutes)

Presenter: MARCHISONE, Massimiliano (Centre National de la Recherche Scientifique (FR))

Session Classification: Parallel Performance
Flavour tagging in the LHC experiments

Monday, 20 May 2019 14:54 (20 minutes)

Presenter: MANZONI, Riccardo (ETH Zurich (CH))
Session Classification: Parallel Performance
Performance of the LHCb trigger and full real-time reconstruction in Run 2 of the LHC

Monday, 20 May 2019 15:18 (20 minutes)

Presenter: POLCI, Francesco (Centre National de la Recherche Scientifique (FR))

Session Classification: Parallel Performance
Reconstruction at 30 MHz for the LHCb upgrade

Monday, 20 May 2019 15:42 (15 minutes)

Presenter: SANTANA RANGEL, Murilo (Federal University of Rio de Janeiro (BR))
Session Classification: Parallel Performance
Accuracy of parton showers: status and prospects

Thursday, 23 May 2019 11:30 (15 minutes)

Presenter: DASGUPTA, Mrinal (Unknown)

Session Classification: Parallel Performance
Overview of ML and BigData Tools used by the HEP experiments

Thursday, 23 May 2019 11:48 (20 minutes)

Presenter:  CASTANEDA, Alfredo (Universidad de Sonora (MX))

Session Classification:  Parallel Performance
Fast detector simulations for LHC experiments

Thursday, 23 May 2019 12:12 (20 minutes)

Presenter: BEIN, Samuel Louis (Hamburg University (DE))
Session Classification: Parallel Performance
Using ML techniques for Data Quality Monitoring in CMS and ALICE experiments

*Thursday, 23 May 2019 12:36 (20 minutes)*

**Presenter:** DEJA, Kamil Rafal (Warsaw University of Technology (PL))

**Session Classification:** Parallel Performance
Lepton and Photon reconstruction and identification performance in ATLAS and CMS

Friday, 24 May 2019 11:30 (15 minutes)

Presenter: MARCHESE, Luigi (University of Oxford (GB))
Session Classification: Parallel Performance
Tracking performance and prospects in ATLAS and CMS

Friday, 24 May 2019 12:42 (18 minutes)

Presenter: BUTTI, Pierfrancesco (CERN)
Session Classification: Parallel Performance
CMS Trigger performance including machine learning applications

Friday, 24 May 2019 11:48 (15 minutes)

Presenter:  RANKIN, Dylan Sheldon (Massachusetts Inst. of Technology (US))
Session Classification:  Parallel Performance
Techniques for Tagging Hadronically Decaying W/Z/Top and Higgs Particles in ATLAS

Friday, 24 May 2019 12:06 (15 minutes)

Presenter: MILLER, David (University of Chicago (US))
Session Classification: Parallel Performance
The ALICE TPC: optimization of the performance in RUN 2 and developments for the future

Friday, 24 May 2019 12:24 (15 minutes)

Presenter:  HELLBAR, Ernst (Johann-Wolfgang-Goethe Univ. (DE))

Session Classification:  Parallel Performance
Precise modeling of $tt\bar{b}+jets/b\bar{b}ar/t\bar{t}bar$ final states

Thursday, 23 May 2019 11:30 (20 minutes)

Presenter: JEZO, Tomas (University of Zurich)
Session Classification: Parallel Top
Measurement of $t\bar{t}+X$ including 4tops with ATLAS

Thursday, 23 May 2019 12:00 (17 minutes)

Presenter:  NELLIST, Clara (Georg August Universitaet Goettingen (DE))

Session Classification:  Parallel Top
Measurement of $t\bar{t}+X$ including 4tops with CMS

Thursday, 23 May 2019 12:20 (17 minutes)

Presenter: KIM, Tae Jeong (Hanyang University (KR))
Session Classification: Parallel Top
Latest LHC searches for new interactions with top quarks

Thursday, 23 May 2019 12:40 (17 minutes)

Presenter: FAROOQUE, Trisha (Michigan State University (US))
Session Classification: Parallel Top
Latest measurements in single top quark with the ATLAS experiment

Friday, 24 May 2019 11:30 (17 minutes)

Presenter: HIRSCHBUEHL, Dominic (Bergische Universitaet Wuppertal (DE))
Session Classification: Parallel Top
Latest measurements in single top quark with the CMS experiment

Friday, 24 May 2019 11:50 (17 minutes)

Presenter:  IEMMI, Fabio (Universita e INFN, Bologna (IT))

Session Classification:  Parallel Top
Towards global fits in EFT’s and New Physics implications

Friday, 24 May 2019 12:10 (20 minutes)

Presenter: SLADE, Emma (University of Oxford)

Session Classification: Parallel Top
EFT interpretations of top quark measurements at the LHC

Friday, 24 May 2019 12:40 (17 minutes)

Presenter: MAL, Prolay (National Institute of Science Education and Research (IN))

Session Classification: Parallel Top
Recent theoretical developments on jets in heavy-ion collisions

Tuesday, 21 May 2019 11:30 (17 minutes)

Presenter: Dr MEHTAR-TANI, Yacine (Brookhaven National Laboratory)
Session Classification: Parallel Heavy Ions
Latest results on jet suppression and jet substructure in heavy-ion collisions with CMS

*Tuesday, 21 May 2019 11:50 (17 minutes)*

**Presenter:** VIINIKAINEN, Jussi (University of Illinois at Chicago (US))

**Session Classification:** Parallel Heavy Ions
Latest results on jet suppression and jet substructure in heavy-ion collisions with ATLAS

Tuesday, 21 May 2019 12:10 (17 minutes)

Presenter: RYBAR, Martin (Columbia University (US))

Session Classification: Parallel Heavy Ions
Recent results on hard probes in heavy-ion collisions from ALICE and LHCb

Tuesday, 21 May 2019 12:30 (17 minutes)

**Presenter:** HOSOKAWA, Ritsuya (University of Tsukuba (JP))

**Session Classification:** Parallel Heavy Ions
Discussion

Tuesday, 21 May 2019 12:50 (10 minutes)

Session Classification: Parallel Heavy Ions
Recent results on collectivity and correlations in heavy-ion collisions from ATLAS

*Wednesday, 22 May 2019 11:30 (20 minutes)*

**Presenter:** DERENDARZ, Dominik Karol (Polish Academy of Sciences (PL))

**Session Classification:** Parallel Heavy Ions
Recent results on collective effects and soft particle production in heavy-ion collisions from ALICE

Wednesday, 22 May 2019 11:55 (20 minutes)

Presenter: JACAZIO, Nicolo (Universita e INFN, Bologna (IT))
Session Classification: Parallel Heavy Ions
Recent results on collectivity and particle correlations with CMS

*Wednesday, 22 May 2019 12:20 (20 minutes)*

**Presenter:** MURILLO QUIJADA, Javier Alberto (Universidad de Sonora (MX))

**Session Classification:** Parallel Heavy Ions
Discussion

Wednesday, 22 May 2019 12:45 (15 minutes)

Session Classification: Parallel Heavy Ions
Theoretical developments in the physics of ultra-peripheral ion-ion collisions

Friday, 24 May 2019 14:30 (17 minutes)

Presenter: Dr KLUSEK-GAWENDA, Mariola (Institute of Nuclear Physics Polish Academy of Sciences)

Session Classification: Parallel Heavy Ions
QCD low $x$ evolution and the onset of gluon saturation in exclusive photo-production of vector mesons

Friday, 24 May 2019 15:30 (17 minutes)

Presenter: HENTSCHINSKI, Martin (Universidad de las Americas, Puebla)

Session Classification: Parallel Heavy Ions
Recent ALICE results on ultra-peripheral collisions

Friday, 24 May 2019 14:50 (17 minutes)

Presenter: HORAK, David (Czech Technical University (CZ))
Session Classification: Parallel Heavy Ions
Recent results in ultra-peripheral collisions with ATLAS and CMS

Friday, 24 May 2019 15:10 (17 minutes)

Presenter: Prof. TAPIA TAKAKI, Daniel (University of Kansas)
Session Classification: Parallel Heavy Ions
Discussion

Friday, 24 May 2019 15:50 (10 minutes)

Session Classification:  Parallel Heavy Ions
Using Expertise from High-Energy Physics for Social and Humanitarian Impact

Tuesday, 21 May 2019 14:30 (15 minutes)

Presenter: POTAMIANOS, Karolos (Deutsches Elektronen-Synchrotron (DE))
Session Classification: Parallel Outreach
Particle Physics Outreach as Strategic Pillar for Society: A Report from IPPOG

Tuesday, 21 May 2019 14:48 (15 minutes)

Presenter: MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE))

Session Classification: Parallel Outreach
Open Data at CMS: Status and Plans

Tuesday, 21 May 2019 15:06 (15 minutes)

Presenter: Dr MCCAULEY, Thomas (University of Notre Dame (US))

Session Classification: Parallel Outreach
Machine Learning using CERN Open Data

Tuesday, 21 May 2019 15:24 (15 minutes)

Presenter:  DUARTE, Javier Mauricio (Fermi National Accelerator Lab. (US))
Session Classification:  Parallel Outreach
Panel Discussion

Tuesday, 21 May 2019 15:42 (18 minutes)

The proposed topics for discussion are:
- Reaching out to society: how to maintain/increase the impact of the LHC?
- LHC Open Data for research: potential, perspectives and challenges.

Presenters: NELLIST, Clara (Georg August Universitaet Goettingen (DE)); CARRERA JARRIN, Edgar Fernando (Universidad San Francisco de Quito (EC)); DUARTE, Javier Mauricio (Fermi National Accelerator Lab. (US)); POTAMIANOS, Karolos (Deutsches Elektronen-Synchrotron (DE)); MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE)); MCCAULEY, Thomas (University of Notre Dame (US))

Session Classification: Parallel Outreach
Lepton flavor violating tau decays in the presence of massive neutrino

Tuesday, 21 May 2019 11:30 (22 minutes)

Presenter:  HERNÁNDEZ-TOMÉ, Gerardo (CINVESTAV)
Session Classification:  Parallel Heavy Flavour
Quarkonia and open heavy-flavour measurements with ALICE

Tuesday, 21 May 2019 11:52 (22 minutes)

Presenter: LUPARELLO, Grazia (Universita e INFN Trieste (IT))

Session Classification: Parallel Heavy Flavour
Spectroscopy in ATLAS and CMS

Tuesday, 21 May 2019 12:14 (28 minutes)

Presenter: MEJIA GUISO, Jhovanny Andres (Centro Invest. Estudios Avanz. IPN (MX))

Session Classification: Parallel Heavy Flavour
Spectroscopy in ATLAS

Session Classification: Parallel Heavy Flavour
Discussion

Tuesday, 21 May 2019 12:42 (18 minutes)

Session Classification: Parallel Heavy Flavour
Measuring CP violation in $b \rightarrow c\tau\bar{\nu}$ using excited charm mesons

*Thursday, 23 May 2019 15:06 (18 minutes)*

**Presenter:** ALONI, Daniel  
**Session Classification:** Parallel Heavy Flavour
Recent results using semileptonic decays with LHCb

Thursday, 23 May 2019 15:24 (18 minutes)

Presenter: Dr ROMERO VIDAL, Antonio (Universidade de Santiago de Compostela (ES), Instituto Galego de Física de Altas Enerxías (IGFAE))

Session Classification: Parallel Heavy Flavour
Rare decays in CMS and ATLAS

Thursday, 23 May 2019 14:48 (18 minutes)

Presenter: HEREDIA DE LA CRUZ, Ivan (Centro de Investigación y de Estudios Avanzados del IPN (MX))

Session Classification: Parallel Heavy Flavour
Recent results using rare decays with LHCb

**Presenter:** BELLEE, Violaine (EPFL - Ecole Polytechnique Federale Lausanne (CH))

**Session Classification:** Parallel Heavy Flavour
Discussion

Thursday, 23 May 2019 15:42 (18 minutes)

Session Classification: Parallel Heavy Flavour
CP violation in D physics: mini-review

Friday, 24 May 2019 14:30 (18 minutes)

Presenter: VAQUERA-ARAUJO, Carlos Alberto (University of Guanajuato)

Session Classification: Parallel Heavy Flavour
CP violation in charm with LHCb

Friday, 24 May 2019 14:48 (18 minutes)

Presenter:  HILTON, Martha (University of Manchester (GB))
Session Classification:  Parallel Heavy Flavour
CP violation in beauty with LHCb

Friday, 24 May 2019 15:06 (18 minutes)

Presenter: CRUZ TORRES, Melissa Maria (CBPF - Brazilian Center for Physics Research (BR))

Session Classification: Parallel Heavy Flavour
CP violation with ATLAS and CMS

Friday, 24 May 2019 15:24 (18 minutes)

Presenter:  BONA, Marcella (Queen Mary University of London (UK))
Session Classification:  Parallel Heavy Flavour
Discussion

Session Classification: Parallel Heavy Flavour
Heavy quark mass effects in V+HF

Tuesday, 21 May 2019 14:30 (17 minutes)

Presenter: NAPOLETANO, Davide (Ipht, Saclay)
Session Classification: Parallel QCD/HF
discussion

Tuesday, 21 May 2019 15:44 (16 minutes)

Session Classification: Parallel QCD/HF
Measurements of V+heavy flavor with CMS

Tuesday, 21 May 2019 14:50 (15 minutes)

Presenter: BILIN, Bugra (Universite Libre de Bruxelles (BE))

Session Classification: Parallel QCD/HF
Heavy-flavour jet measurements with ALICE

Tuesday, 21 May 2019 15:08 (15 minutes)

Presenter: MAZZILLI, Marianna (Universita e INFN, Bari (IT))

Session Classification: Parallel QCD/HF
Recent results on heavy flavor production and spectroscopy with LHCb

Tuesday, 21 May 2019 15:26 (15 minutes)

Presenter: GANDINI, Paolo (INFN Milano (IT))

Session Classification: Parallel QCD/HF
Higgs in SUSY and the relation to stops - global scans

Tuesday, 21 May 2019 11:30 (17 minutes)

Presenter: KULKARNI, Suchita (Austrian Academy of Sciences (AT))

Session Classification: Parallel SUSY
Searches for gluinos and squarks

Tuesday, 21 May 2019 11:50 (17 minutes)

Presenter: VAMI, Tamas Almos (Wigner RCP, Budapest (HU))
Session Classification: Parallel SUSY
Searches for stop and sbottom in ATLAS

Tuesday, 21 May 2019 12:10 (17 minutes)

Presenter:  SIMONIELLO, Rosa (Johannes Gutenberg Universitaet Mainz (DE))

Session Classification:  Parallel SUSY
Searches for stop and sbottom in CMS

Tuesday, 21 May 2019 12:30 (17 minutes)

Presenter: PASTIKA, Nathaniel Joseph (Baylor University (US))
Session Classification: Parallel SUSY
Contribution ID: 322

Discussion

Tuesday, 21 May 2019 12:50 (10 minutes)

Session Classification: Parallel SUSY
Electroweak SUSY: theoretical overview

Wednesday, 22 May 2019 11:30 (17 minutes)

Presenter: Dr SHAH, Nausheen (Wayne State University)
Session Classification: Parallel SUSY
Contribution ID: 324

Searches for staus

Wednesday, 22 May 2019 11:50 (17 minutes)

Presenter: MANN, Alexander (Ludwig-Maximilians-Universität München (DE))

Session Classification: Parallel SUSY
Searches for charginos and neutralinos in ATLAS

Wednesday, 22 May 2019 12:10 (17 minutes)

Presenter: LONGO, Luigi (CERN)
Session Classification: Parallel SUSY
Searches for charginos and neutralinos in CMS

Wednesday, 22 May 2019 12:30 (17 minutes)

Presenter: BEIN, Samuel Louis (Hamburg University (DE))
Session Classification: Parallel SUSY
Contribution ID: 327

Type: not specified

Discussion

Wednesday, 22 May 2019 12:50 (10 minutes)

Session Classification: Parallel SUSY
Unconventional signatures and LLP

Presenter: DESAI, Nishita (LUPM, Montpellier)
Session Classification: Parallel SUSY
Searches for LLP in ATLAS

Thursday, 23 May 2019 15:10 (17 minutes)

Presenter: MEHLHASE, Sascha (Ludwig Maximilians Universitat (DE))
Session Classification: Parallel SUSY
Searches for LLP in CMS

Thursday, 23 May 2019 15:30 (17 minutes)

Presenter: KAZANA, Malgorzata (NCBJ Warsaw (PL))
Session Classification: Parallel SUSY
Unconventional signatures: theory review, future experiments and non-ATLAS and CMS searches

Thursday, 23 May 2019 14:30 (34 minutes)

Presenter: PINFOLD, James (University of Alberta (CA))
Session Classification: Parallel SUSY
Discussion

Session Classification: Parallel SUSY
Status and recent developments in NNLO QCD for jet production

Monday, 20 May 2019 14:30 (20 minutes)

Presenter: BOUGHEZAL, Radja (Argonne National Laboratory)

Session Classification: Parallel QCD/HF
Multijet and photon+jet measurements with CMS

Monday, 20 May 2019 14:53 (20 minutes)

Presenter: BALDENEgro BARRERA, Cristian (The University of Kansas (US))
Session Classification: Parallel QCD/HF
Contribution ID: 335

Type: not specified

discussion

Monday, 20 May 2019 15:40 (20 minutes)

Session Classification: Parallel QCD/HF
All order results in jet production

Monday, 20 May 2019 15:16 (20 minutes)

**Presenter:** CAL, Pedro

**Session Classification:** Parallel QCD/HF
Recent Developments in Jet Substructure Theory

Wednesday, 22 May 2019 11:30 (17 minutes)

Presenter:  Prof. KANG, Zhongbo (UCLA)
Session Classification:  Parallel QCD/HF
Contribution ID: 338

Type: not specified

[included in next talk] Measurements of jet fragmentation and jet substructure with ATLAS

Session Classification: Parallel QCD/HF
Measurements of jet fragmentation and jet substructure with ATLAS and CMS

Wednesday, 22 May 2019 11:50 (30 minutes)

Presenter:  KIRSCHENMANN, Henning (Helsinki Institute of Physics (FI))

Session Classification:  Parallel QCD/HF
Measurements of jet fragmentation and jet substructure with ALICE

Wednesday, 22 May 2019 12:24 (15 minutes)

Presenter: FASEL, Markus (Oak Ridge National Laboratory - (US))
Session Classification: Parallel QCD/HF
Jet fragmentation studies at LHCb

*Wednesday, 22 May 2019 12:42 (15 minutes)*

**Presenter:** SANTANA RANGEL, Murilo (Federal University of of Rio de Janeiro (BR))

**Session Classification:** Parallel QCD/HF
Theory on collective effects and MC simulation

Thursday, 23 May 2019 11:50 (17 minutes)

Presenter: KIRCHGAESSER, Patrick
Session Classification: Parallel QCD/HF

August 31, 2020
Particle production vs multiplicity in pp with ALICE

Thursday, 23 May 2019 12:10 (15 minutes)

Presenter: JAHNKE, Cristiane (Technische Universitaet Muenchen (DE))

Session Classification: Parallel QCD/HF
Event shape studies in pp with ALICE

Thursday, 23 May 2019 12:27 (15 minutes)

Presenter: SIMATOVIC, Goran (Nikhef National institute for subatomic physics (NL))

Session Classification: Parallel QCD/HF
Recent soft QCD results from ATLAS and CMS

*Thursday, 23 May 2019 12:44 (16 minutes)*

**Presenter:** CAIRO, Valentina (SLAC National Accelerator Laboratory (US))

**Session Classification:** Parallel QCD/HF
Probing g→bb with inclusive jets and V+jets with ATLAS

Thursday, 23 May 2019 11:30 (15 minutes)

**Presenter:** CAIRO, Valentina (SLAC National Accelerator Laboratory (US))

**Session Classification:** Parallel QCD/HF
Lepton Universality

*Tuesday, 21 May 2019 09:00 (20 minutes)*

**Presenter:** ALVAREZ CARTELLE, Paula (Imperial College (GB))

**Session Classification:** Plenary II
New Physics in Vector Boson Scattering at the LHC

Friday, 24 May 2019 15:45 (12 minutes)

Presenter: REUTER, Jürgen (DESY Hamburg, Germany)
Session Classification: Parallel EWK
Discussion: Feedback from European Strategy

Saturday, 25 May 2019 10:45 (15 minutes)

Presenter: WULZER, Andrea (CERN and EPFL)
Session Classification: Discussion: Feedback from European Strategy meeting
2019 EPS Prize

Saturday, 25 May 2019 09:00 (1 minute)

Presenters:  DENISOV, Dmitri Sergeevich (Fermi National Accelerator Lab. (US));  GIACOMELLI, Paolo (Universita e INFN, Bologna (IT))

Session Classification:  Plenary IX