6th International Workshop on High Energy Physics in the LHC Era

Report of Abstracts

Abstract ID : **2**

ELECTROMAGNETIC SIGNAL FROM QUARK GLUON PLASMA IN HEAVY ION COLLISION

Content

A system of chemically non-equilibrated quark-gluon plasma is considered to study the electromagnetic signal with the effect of finite chemical potential. The electromagnetic signal is evaluated for one loop and two loop processes considering the quasi model of quark. The emission spectra is obtained by integrating the photon rate over the space-time history of plasma. The results are compared with the other results of electromagnetic emission from quark-gluon plasma with and without quark chemical potential. Our results are good in comparison to other results of electromagnetic emission.

Primary author(s) : KUMAR, Yogesh (university of delhi, india); Mr. SETHY, Pradyumna (Univeristy of Delhi)

Presenter(s) : KUMAR, Yogesh (university of delhi, india)

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **KUMAR, Yogesh** on **Monday 31 August 2015**

Abstract ID : **3**

First results on Vector Bilepton production based on LHC data and predictions for Run II

Content

In this work one investigates the LHC potential for discovering doubly-charged vector bileptons considering the measurable process $p, p \to m^+, m^+, m^-, m^-, X$. We perform the study assuming different bilepton masses and different exotics quark masses. The process cross-section is calculated at leading-order using the CALCHEP package. Combining this calculation with the latest ATLAS results at 7 TeV, we derive, for the first time, bounds on bilepton mass using LHC data. The results exclude bileptons with masses in the range 200 GeV to 500 GeV, depending on the exotics quarks masses. A detector simulation is also performed using the DELPHES package assuming a LHC center-of-mass energy of 13 TeV. The results of the simulation are used to obtain minimal integrated luminosities needed for discovering and for setting limits on bilepton masses at 13 TeV.

Primary author(s) : Prof. NEPOMUCENO, Andre (Universidade Federal Fluminense)

Co-author(s) : MEIROSE, Bernhard (University of Texas at Dallas (US))

Presenter(s) : Prof. NEPOMUCENO, Andre (Universidade Federal Fluminense)

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **ASEVEDO NEPOMUCENO, Andre** on **Thursday 03 September 2015**

Abstract ID : **5**

Efective QCD phase diagram with magnetic fields

Content

We study the QCD phase diagram in the temperature vs. quark chemical potential plane in the presence of a magnetic field, using the linear sigma model coupled to quarks. It is shown that the decrease of the couplings with increasing field strength obtained within the model leads to the critical temperature for the phase transition to decrease with increasing field intensity (inverse magnetic catalysis). This happens provided that plasma screening is properly accounted for. It is also found that with increasing field strength the location of the critical end point (CEP) in the phase diagram moves toward lower values of the critical quark chemical potential and larger values of the critical temperature. In addition, the CEP approaches the temperature axis for large values of the magnetic field, in agreement with lattice results. We argue that a similar behavior is to be expected in QCD, since the physical impact of the magnetic field, regardless of strength, is to produce a spatial dimension reduction, whereby virtual quark-antiquark pairs are closer on average and thus, the strength of their interaction decreases due to asymptotic freedom.

Primary author(s) : Prof. AYALA, Alejandro (Instituto de Ciencias Nucleares, UNAM)

Co-author(s) : Prof. LOEWE, Marcelo (Pontificia Universidad Catolica); Dr. ZAMORA, Renato (Pontificia Universidad Catolica); Prof. DOMINGUEZ, Cesareo (University of Cape Town); Dr. HERNADEZ, Luis (University of Cape Town)

Presenter(s) : Prof. AYALA, Alejandro (Instituto de Ciencias Nucleares, UNAM)

Track Classification : Heavy Ion collisions

Comments:
Speaker declined invitation

Status: WITHDRAWN

Track Judgements:

Submitted by **UNKNOWN, Unknown** on **Monday 14 September 2015**

Abstract ID : **6**

Recent Results from The Telescope Array Ultra High Energy Cosmic Ray Observatory

Content

The Telescope Array measures the properties of ultra high energy cosmic ray induced extensive air showers. We do this using a variety of techniques including an array of scintillator detectors to sample the footprint of the air shower when it reaches the Earth's surface and telescopes to measure the fluorescence and Cerenkov light of the air shower. From this we determine the energy spectrum and chemical composition of the primary particles. We also search for sources of cosmic rays and anisotropy. We have found evidence of a possible source of ultra high energy cosmic rays in the northern sky. The experiment and its most recent measurements will be discussed.

Primary author(s) : MATTHEWS, John (University of Utah)

Presenter(s) : MATTHEWS, John (University of Utah)

Track Classification : Astroparticles

Comments:
Ultra High Energy Cosmic Rays Sources Composition Fluorescence Cerenkov hybrid detection

Status: SUBMITTED

Track Judgements:

Submitted by **MATTHEWS, John** on **Friday 18 September 2015**

Abstract ID : **7**

LIVING WITH THE GHOSTS

Content

We explore the idea that the fundamental Theory of Everything is a conventional quantum theory living in a higher-dimensional bulk. To be renormalizable, it should involve higher derivatives in the Lagrangian. Such theories are not usually considered viable because of the ghosts (the absence of the ground state in the Hamiltonian), which often bring about collapse and violation of unitarity. We show, however, that not all ghost-ridden theories have this property. We have constructed nontrivial interacting quantum-mechanical and field-theory supersymmetric models that involve higher derivatives and ghosts, but there is no collapse, such that the Hamiltonian is Hermitian and the evolution operator is unitary.

Primary author(s) : Dr. SMILGA, Andrei (SUBATECH, Nantes)

Presenter(s) : Dr. SMILGA, Andrei (SUBATECH, Nantes)

Comments:
Speaker declined invitation

Status: WITHDRAWN

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 23 September 2015**

Abstract ID : **9**

Overview of the latest LHCb results

Content

The LHCb experiment collected unprecedented samples of heavy flavoured hadrons from pp collisions. Precision measurements of CP-violating observables and studies of rare decays are providing the some of the strongest constraints on scenarios beyond the Standard Model and have excellent potential to reveal new physics as the precision is improved. Exciting deviations from the Standard Model have been seen in rare decays, which could indicate new couplings. Beside these key measurements, LHCb results cover a wide physics spectrum: heavy flavour production and spectroscopy, exotic heavy flavour states, physics of the so-far little known Bc meson, electroweak physics, and more. A selection of recent LHCb results is presented, and prospects for future measurements with larger data samples, to be collected notably after the detector upgrade, are briefly discussed.

Primary author(s) : ROBBE, Patrick (Laboratoire de l'Accelerateur Lineaire (FR))

Presenter(s) : ROBBE, Patrick (Laboratoire de l'Accelerateur Lineaire (FR))

Track Classification : Hadron Spectroscopy

Comments:
Talk on behalf of the LHCb collaboration

Status: SUBMITTED

Track Judgements:

Hadron Spectroscopy: Conflict

Submitted by **ROBBE, Patrick** on **Sunday 27 September 2015**

Abstract ID : **10**

Strong limit on the spatial and temporal variations of the fine-structure constant from analysis of distant quasar spectra

Content

We report a new constraint on the spatial and temporal variations of the fine-structure constant based on the analysis of a new sample of CIII, NV, MgII, AlIII and SiIV doublet absorptions systems over a redshift range of 0.4939 $\leq$ z $\leq$2.2312. We derive limit of $\Delta\alpha$[U+2044]α=(0.21$\pm$0.3)$\times$[U+3016]10[U+3017]^(-5). This result is the strongest constraint on $\Delta\alpha$[U+2044]α based on the analysis of high redshift quasar absorption line systems in the literate.

Primary author(s) : Dr. LE, Duc Thong (Department of Physics, CNS, Vietnam)

Presenter(s) : Dr. LE, Duc Thong (Department of Physics, CNS, Vietnam)

Track Classification : Beyond SM

Status: WITHDRAWN

Track Judgements:

Submitted by **D T, Le** on **Monday 28 September 2015**

Abstract ID : **11**

Nelson Barr-ogenesis: a complete model for all known and required CP violation.

Content

We present a complete, testable, calculable and predictive model for all known and required CP violation. The origin of all CP violation and flavor mixing is contained in the setup of a supersymmetric SU(5) unified Nelson-Barr mechanism which provides a solution for the strong CP problem. The scale of spontaneous CP breaking is taken to be larger than the right handed (RH) neutrino masses to allow for thermal leptogenesis. Supersymmetry protects the strong CP phase from dangerous contributions induced by the large CP breaking scale. The low energy theory is a supersymmetric type I seesaw model, with all flavor mixing and CP violating effects contained in a wave function renormalization matrix. The model accommodates the measured neutrino mass splittings and mixing angles, explains part of the flavor structure of the lepton sector, predicts the lightest neutrino mass to be in the range $10^{-2} - 10^{-3}$ eV, predicts the CP violating phases of the PMNS matrix, solves the strong CP problem, predicts the UV CP violating phases and mixing angles of the type I see-saw model for given RH neutrino masses, and gives the correct baryon asymmetry through hierarchical thermal leptogenesis for a RH neutrino mass $M_1 10^9 GeV$. Calculations are considerably simplified by making use of background flavor symmetry invariants.

Primary author(s) : EGANA-UGRINOVIC, Daniel (Rutgers University)

Co-author(s) : THOMAS, Scott David (Rutgers, State Univ. of New Jersey (US)); SHIN, Chang Sub (Rutgers University); MONTEUX, Angelo (Rutgers University)

Presenter(s) : EGANA-UGRINOVIC, Daniel (Rutgers University)

Track Classification : Neutrino Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **EGANA, Daniel** on **Monday 28 September 2015**

Abstract ID : **12**

HADRONIC g-2 OF THE MUON: A THEORETICAL QCD DETERMINATION

Content

The leading hadronic contribution to g-2 of the muon, in the charm- and the bottom-quark region, can be calculated analytically in QCD [1], using the well-known perturbative expansion in inverse powers of the quark mass at zero-momentum. The result is in perfect agreement with Lattice-QCD (LQCD) determinations [2]. In the light-quark sector a theoretical determination will require independent information on the first few derivatives of the electromagnetic correlator at zero momentum, currently available from LQCD with large uncertainties. As a provisional determination, a Dual-Large N c QCD model is used to obtain these derivatives, leading to full agreement with experiment, thus solving the current discrepancy [1]. The inadequacy of current data on e + e - annihilation into hadrons is shown by determining g-2 from an expression which quenches considerably the weight of these data. This leads to a final value closer to experiment [3], i.e. a discrepancy of 2.4σ instead of the standard 3.6σ.

[1] S. Bodenstein, C. A. Dominguez, and K. Schilcher, Phys. Rev. D 85, 014029 (2012). [2] ETM Collaboration, F.Burger et al. JHEP 1402 (2014) 099, and K. Jansen, private communication; HPQCD Collaboration, B. Chakraborty et al. Phys. Rev. D 89, 114501 (2014). [3] S. Bodenstein, C. A. Dominguez, K. Schilcher, and H. Spiesberger, Phys. Rev. D 88, 014005 (2013).

Primary author(s) : Prof. DOMINGUEZ, Cesareo (University of Cape Town)

Presenter(s) : Prof. DOMINGUEZ, Cesareo (University of Cape Town)

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 30 September 2015**

Abstract ID : **13**

Recent results on soft QCD topics, and jet and photon production from ATLAS

Content

ATLAS has has performed several measurements of phenomena connected to QCD at soft scales or at the transition to the hard regime. These include the measurements at different centre-of-mass energies in Run-1 and Run-2 of the elastic, inelastic and total cross sections in pp collisions, the properties of minimum bias and the underlying event interactions, particle production and their correlations, as well as of diffractive and exclusive events. These results are sensitive to non-perturbative models of soft QCD. Jet and photon production cross sections have been measured differentially for inclusive and multi-object final states at 7, 8 and 13 TeV pp collisions with the ATLAS detector and are compared to expectations based on next-to-leading order QCD calculations as well as Monte Carlo simulations. Further studies of jet production properties include the measurements of jet properties, and the determination of the strong coupling constant alpha_s. These measurements provide direct probes of short-distance physics and are sensitive to the parton densities of the proton, as well as fragmentation models.

Primary author(s) : VILLAPLANA PEREZ, Miguel (Università degli Studi e INFN Milano (IT))

Presenter(s) : VILLAPLANA PEREZ, Miguel (Università degli Studi e INFN Milano (IT))

Track Classification : Non-perturbative QCD

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **14**

Measurements of single and multi-boson production with the ATLAS detector

Content

The inclusive productions of the W and the on- or off-shell Z/gamma* bosons are standard candles at hadron colliders, while the productions of jets in association with a W or a Z boson are important processes to study QCD in multi-scale environments. The measurements of their production cross-sections integrated and differential in several variables have been measured at 7, 8 and 13 TeV centre-of-mass energies and are compared to high-order QCD calculations and Monte Carlo simulations. These measurements have an impact on our knowledge of the parton densities of the proton, tests soft resummation effects and hard emissions for small and large momentum transfers and in multi-scale processes. The ATLAS Collaboration is also engaged in precision measurements of fundamental Standard Model parameters in Drell-Yan final state, e.g. the weak-mixing angle and the W mass. The ATLAS collaboration has also carried out a set of measurements that provide stringent tests of the electroweak sector of Standard Model at different centre-of-mass energies, specifically on di- and multi-boson production cross sections, vector boson fusion and scattering, as well as triple and quartic gauge-boson couplings. These measurements are compared to (N)NLO QCD predictions of the Standard Model and provide model-independent constraints on new physics, by setting limits on anomalous gauge-boson couplings.

Primary author(s) : FERRARI, Roberto (INFN Pavia (IT))

Presenter(s) : FERRARI, Roberto (INFN Pavia (IT))

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **15**

Run-2 Supersymmetry searches in ATLAS

Content

Despite the absence of experimental evidence, weak scale supersymmetry remains one of the best motivated and studied Standard Model extensions. With the large increase in collision energy with the LHC Run-2 (from 8TeV to 13 TeV) the sensitivity to heavy strongly produced SUSY particles (squarks and gluinos) increases tremendously. This talk presents recent ATLAS Run-2 searches for such particles in final states including jets, missing transverse momentum, and possibly light leptons.

Primary author(s) : SOFFER, Abi (Tel Aviv University (IL))

Presenter(s) : SOFFER, Abi (Tel Aviv University (IL))

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **16**

Recent results on Exotics searches from ATLAS experiment at the LHC

Content

Searches for new physics beyond the Standard Model at LHC Run II with the ATLAS detector are presented in this talk. The 13 TeV center of mass energy at LHC Run II will significantly increase sensitivity to new physics at high-energy/high-mass regime compared to Run I. This talk will highlight results on Exotics physics searches in LHC Run II as well as selected results from Run I.

Primary author(s) : BENITEZ, Jose Feliciano (University of Iowa (US))

Presenter(s) : BENITEZ, Jose Feliciano (University of Iowa (US))

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **17**

Recent results on dark matter searches from the ATLAS and CMS experiments at the LHC

Content

Signatures of large missing transverse momentum recoiling against jets, photons, heavy-flavor quarks, weak gauge bosons or Higgs bosons at the LHC provide powerful probe to strongly produced dark matters (DM), which is complementary to direct and indirect DM detection experiments. The LHC DM searches allow us to interpret results in terms of effective field theory and/or simplified models with pair production of WIMPs, as well as relevant SUSY scenarios. In this talk ATLAS and CMS results on dark matter searches are presented, highlighting new results from LHC Run II if available.

Primary author(s) : NELSON, Andy (University of California Irvine (US))

Presenter(s) : NELSON, Andy (University of California Irvine (US))

Track Classification : Dark Matter searches

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **19**

Run 2 ATLAS Trigger and Detector Performance

Content

The 2nd LHC run has started in June 2015 with a pp centre-of-mass collision energy of 13 TeV, and ATLAS has taken first data at this new energy. In this talk the improvements made to the ATLAS experiment during the 2-year shutdown 2013/2014 will be discussed, and first detector and trigger performance results from the Run-2 will be shown.
In general, reconstruction algorithms of tracks, e/gamma, muons, taus, jets and flavour tagging have been improved for Run-2. The new reconstruction algorithms and their performance measured using the data taken in 2015 at sqrt(s)=13 TeV will be discussed. Reconstruction efficiency, isolation performance, transverse momentum resolution and momentum scales are measured in various regions of the detector and in momentum intervals enlarged with respect to those measured in the Run-1.
This presentation will also give an overview of the upgrades to the ATLAS trigger system that have been implemented during the LHC shutdown in order to deal with the increased trigger rates (factor of 5 with respect to the Run-1). The commissioning status of the overall trigger system and its performance in the initial phase of the 2015 data taking campaign will be summarized.

Primary author(s) : WINKLMEIER, Frank (University of Oregon (US))

Presenter(s) : WINKLMEIER, Frank (University of Oregon (US))

Track Classification : Instrumentation and Detectors

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **21**

Top quark production measurements using the ATLAS detector at the LHC

Content

Measurements of the inclusive top quark production cross sections in proton-proton collisions with the ATLAS detector at the Large Hadron Collider are presented. The most precise pair production cross section result requires opposite sign electrons and muons and uses the full data-set at a centre-of-mass energy of 7 and 8 TeV. The first measurements of the ttbar production cross-section at 13 TeV are also presented, using both the dilepton and lepton-plus-jets signatures. Differential measurements of the top transverse momentum and kinematic properties of the top-anti-top pair at 8 TeV are discussed. These measurements, including results using boosted tops, probe our understanding of top pair production in the TeV regime. The results, unfolded to particle and parton level, are compared to recent Monte Carlo generators implementing LO and NLO matrix elements matched with parton showers and NLO QCD calculations. In addition, the production of top quark pairs in association with vector bosons and additional jets are discussed. These processes are important backgrounds to many new physics searches and the results are compared to the Standard Model predictions.

Primary author(s) : SALAMANNA, Giuseppe (Roma Tre Universita Degli Studi (IT))

Presenter(s) : SALAMANNA, Giuseppe (Roma Tre Universita Degli Studi (IT))

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **22**

Top quark property measurements with the ATLAS detector and probing for new physics

Content

The top quark is the heaviest known fundamental particle and probing its couplings with the other fundamental particle may open a window to physics beyond the Standard Model. Measurements of the charge asymmetry in top quark pair events are presented. The charge asymmetry is expected to be small in the Standard Model, but can be enhanced by the presence of new physics. The measurements use the 2012 ATLAS dataset and include a measurement using specialized algorithms to select high transverse momentum top quarks. Searches for flavour changing neutral current top quark decays using the full 2012 ATLAS dataset are presented. The searches target the exotic top quark decays t->Zq and t->Hq, and in the case of the Higgs boson exploit multiple different Higgs boson decay modes. Single top quark events are used to probe for anomalous couplings between the top quark and the light quarks and gluons. In addition, a new measurement using the 2011 ATLAS dataset is presented, where measurements of the different decay rates in single top quark events are used to set limits on potential anomalous couplings at the Wtb vertex.

Primary author(s) : MASETTI, Lucia (Johannes-Gutenberg-Universitaet Mainz (DE))

Presenter(s) : MASETTI, Lucia (Johannes-Gutenberg-Universitaet Mainz (DE))

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **23**

$\mathbf{R}_{A}Aandv2ofmuonsfromheavy-quarkdecaysinlead-leadcollisionsatsqrt(sNN)=2.76TeVwiththeATLASdetector$

Content

The ATLAS measurement of the nuclear modification factor (R_AA) and the elliptic flow (v2) of muons from heavy quark decays in Pb+Pb collisions at sqrt(s_NN)= 2.76 TeV are presented. The measurements are done over the pT range of 4-14 GeV and over the centrality range of (0-60)% within pseudorapidity interval of $|\eta|<1$. A significant elliptic flow is observed over the full pT range for all centralities. The R_AA results are consistent with previous measurements but have much better statistical precision. More than a factor of two suppression of the muon yield relative to scaled pp data is observed in the most central collisions. These measurements give an insight into the interaction of heavy quarks with the bulk medium produced in heavy-ion collisions.

Primary author(s) : ARRATIA MUNOZ, Miguel Ignacio (University of Cambridge (GB))

Presenter(s) : ARRATIA MUNOZ, Miguel Ignacio (University of Cambridge (GB))

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **24**

Recent ATLAS results on jet suppression and modification in Pb+Pb collisions

Content

The ATLAS experiment at the Large Hadron Collider has undertaken a broad jet physics program to probe and characterize the hot nuclear matter created in relativistic lead-lead collisions. The parton shower of hard scattered partons, produced early in the collision, develops as the medium cools and expands, and thus the properties of final-state reconstructed jets are a sensitive probe of medium properties over a variety of temperature and length scales. Recent technical advances in jet reconstruction and calibration in a heavy ion underlying event background have allowed for precise and differential measurements of inclusive jet production, of jet-jet pT and multi-jet production rate correlations, and of internal jet structure. In particular, a recent set of new measurements have focused on better elucidating the flavor, centrality and pT dependence of jet suppression and modification. This talk will give a summary of the latest heavy ion jet results from ATLAS.

Primary author(s) : PEREPELITSA, Dennis Vadimovich (Brookhaven National Laboratory (US))

Presenter(s) : PEREPELITSA, Dennis Vadimovich (Brookhaven National Laboratory (US))

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **KATZY, Judith** on **Friday 02 October 2015**

Abstract ID : **25**

Discrete Flavor Symmetries: Higgs and neutrino physics

Content

I show that imposition of discrete symmetries such as $A_4, S_3, S_4, ...$ is an elegant way to get current pattern of neutrino mass and mixing. With appropriate Higgs extension, we can solve both Flavor and neutrino problems. Some concrete models based on SU(3)_C X SU(3)_L X U(1)_N X G (G=A_4, S_3, S_4) are presented.

Primary author(s) : Prof. LONG, Hoang Ngoc (Vietnam Academy of Science and Technology)

Presenter(s) : Prof. LONG, Hoang Ngoc (Vietnam Academy of Science and Technology)

Track Classification : Higgs Physics; Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Tuesday 06 October 2015**

Abstract ID : **26**

Fermion and scalar phenomenology of a 2-Higgs doublet model with S_3

Content

We propose a 2-Higgs doublet model where the symmetry is extended by $S_3 \otimes Z_3 \otimes Z_3' \otimes Z_{14}$ and the field content is enlarged by extra $SU(2)_L$ singlet scalar fields. S_3 makes the model predictive and leads to viable fermion masses and mixing. The observed hierarchy of the quark masses arises from the Z_3' and Z_{14} symmetries. The light neutrino masses are generated through a type I seesaw mechanism with two heavy Majorana neutrinos. In the lepton sector we obtain mixing angles that are nearly tri-bi-maximal, in an excellent agreement with the observed lepton parameters. The vacuum expectation values required for the model are naturally obtained from the scalar potential, and we analyze the scalar sector properties further constraining the model through the $\gamma\gamma$ decay channel and the T and S parameters.

Primary author(s) : CÁRCAMO HERNÁNDEZ, Antonio Enrique (Universidad Técnica Federico Santa María); DE MEDEIROS VARZIELAS, Ivo (University of Southampton); SCHUMACHER, Erik

Presenter(s) : CÁRCAMO HERNÁNDEZ, Antonio Enrique (Universidad Técnica Federico Santa María)

Track Classification : Higgs Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **CÁRCAMO HERNÁNDEZ, Antonio Enrique** on **Thursday 08 October 2015**

Abstract ID : **27**

Higher-order Lorentz-invariance violation, quantum gravity and fine-tuning

Content

Quantum Gravity Phenomenology, Lorentz invariance violation and loop effects

Primary author(s) : Prof. REYES, Carlos (Universidad del Bio-Bio)

Co-author(s) : Prof. OSSANDON, Sebastian (PUCV); Prof. REYES, Camilo (Universidad Andres Bello)

Presenter(s) : Prof. REYES, Carlos (Universidad del Bio-Bio)

Track Classification : Beyond SM

Comments:

Estimados Organizadores,
Por favor considerar el trabajo publicado en PLB (2015), para una contribucion oral, muchas gracias.

Status: SUBMITTED

Track Judgements:

Submitted by **REYES, Carlos** on **Sunday 11 October 2015**

Abstract ID : **28**

Heavy Ion Physics at RHIC and LHC

Content

An overview of Heavy Ion Physics at the Relativistic Heavy Ion Collider at Brookhaven Laboratory in USA and the Large Hadron Collider at CERN with their most recent highlights will be given. Furthermore we will address open questions and relate them to the future prospects of the Heavy Ion Physics field with existing and future accelerators.

Primary author(s) : Prof. KABANA, Sonja (SUBATECH and University of Nantes (FR))

Presenter(s) : Prof. KABANA, Sonja (SUBATECH and University of Nantes (FR))

Track Classification : Heavy Ion collisions

Status: DUPLICATED (29: Hard QCD probes in heavy ion collisions at RHIC and LHC)

Track Judgements:

Submitted by **KABANA, Sonja** on **Thursday 15 October 2015**

Abstract ID : **29**

Hard QCD probes in heavy ion collisions at RHIC and LHC

Content

Review of hard QCD probes in heavy ion collisions at RHIC and LHC and future prospects.

Primary author(s) : Prof. KABANA, Sonja (SUBATECH and University of Nantes (FR))

Presenter(s) : Prof. KABANA, Sonja (SUBATECH and University of Nantes (FR))

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **KABANA, Sonja** on **Thursday 15 October 2015**

Abstract ID : **170**

LHC constraints on double beta decay

Content

We use LHC dijet data to derive constraints on neutrinoless double beta decay. Upper limits on cross sections for the production of "exotic" resonances, such as a right-handed W boson or a diquark, can be converted into lower limits on the $0\nu\beta\beta$ decay half-life for fixed choices of other parameters. Constraints derived from run-I data are already surprisingly strong and complementary to results from searches using same-sign dileptons plus jets.

Primary author(s) : HELO, Juan (USM)

Presenter(s) : HELO, Juan (USM)

Status: SUBMITTED

Submitted by **UNKNOWN, Unknown** on **Wednesday 21 October 2015**

Abstract ID : **171**

Theory and phenomenology of a knot particle model in deformed spacetime

Content

We discuss how Lie and Hopf type deformations provide a description of elementary particles as knots in an anti de Sitter spacetime.
Lie-type deformations provide a systematic way of generalizing the symmetries of a theory that depends critically on the exact numerical values of its parameters to one that does not. The latter is said to be stable and is likely to be of wider validity than the unstable theory. Hopf-type deformations give rise to quantum groups. These groups are closely related to knot invariants, suggesting a description of elementary particles as solitons with knot symmetries in the deformed theory.
A natural path toward physics beyond the Standard Model is to first Lie-deform Minkowski spacetime with its unstable isometry group to anti de Sitter spacetime with stable isometry group SO(2,3), and subsequently consider its quantum group extension SOq(2,3). Such an approach provides a unifying basis for various promising knot models of particles through the well-developed mathematical formalisms of Lie-type and Hopf-type deformations.
The model predicts massless particles to be composite, a fourth generation of fermions, as well as five Higgs, and a preferred direction in isotonic spin space.

Primary author(s) : Dr. GRESNIGT, Niels (Xi'an Jiaotong-Liverpool University)

Presenter(s) : Dr. GRESNIGT, Niels (Xi'an Jiaotong-Liverpool University)

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Friday 23 October 2015**

Abstract ID : **172**

A calculating of the $(s(x) - \bar{s}(x))$ asymmetry in Proton with holographic wave functions

Content

We study the $s(x) - \bar{s}(x)$ asymmetry in Protons using different types of the light-front quark wave functions inspired by AdS/QCD model. One of the functions, which has a special interest, is the holographic wave function for arbitrary number of constituent.

Primary author(s) : Dr. VEGA, Alfredo (Universidad de Valparaíso)

Co-author(s) : SCHMIDT, Ivan; Dr. GUTSCHE, Thomas (Tubingen University); Dr. LYUBOVITSKIJ, Valery (Tubingen University)

Presenter(s) : Dr. VEGA, Alfredo (Universidad de Valparaíso)

Track Classification : Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **VEGA, Alfredo** on **Saturday 24 October 2015**

Abstract ID : **173**

A family of dilatons for AdS / QCD models

Content

We used supersymmetric quantum mechanics techniques in order to get a family of dilaton fields. The procedure used can be useful to improve AdS / QCD models without changes in spectrum obtained with quadratic dilatons

Primary author(s) : Dr. VEGA, Alfredo (Universidad de Valparaiso)

Co-author(s) : Ms. CABRERA, Paulina (Universidad de Valparaiso)

Presenter(s) : Dr. VEGA, Alfredo (Universidad de Valparaiso)

Track Classification : Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **VEGA, Alfredo** on **Saturday 24 October 2015**

Abstract ID : **174**

Dark matter and its possible connection with neutrino physics

Content

The existence of non-baryonic Dark Matter (DM) is well established by cosmological and astrophysical probes, however its detailed nature still remains elusive. Among the extensions of the Standard Model explaining the DM relic abundance, the simplest one is the addition of an inert scalar to the theory. In this talk I intend to give a brief review the discrete dark matter mechanism, which consists in extending the SM with a non-Abelian flavor symmetry.

Primary author(s) : PEINADO, Eduardo (Instituto de Fisica UNAM)

Presenter(s) : PEINADO, Eduardo (Instituto de Fisica UNAM)

Track Classification : Neutrino Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **PEINADO, Eduardo** on **Thursday 29 October 2015**

Abstract ID : **175**

RHIC Spin Program: Highlights, Recent Results and Future Opportunities

Content

RHIC as the only in the world polarized proton-proton collider continues providing data to help to elucidate the spin structure of the proton and to study QCD dynamics at a high energy scale. I will summarize achievements of the RHIC Spin program and their impact on our understanding of the nucleon spin structure on partonic level, and transverse spin phenomena. I will present first results from the first polarized proton on nucleus collision 2015 run. I will also outline the near and longer term plans and experimental upgrades to further advance spin studies at RHIC.

Primary author(s) : BAZILEVSKY, Alexander (Brookhaven National Laboratory)

Presenter(s) : BAZILEVSKY, Alexander (Brookhaven National Laboratory)

Track Classification : Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **BAZILEVSKY, Alexander** on **Monday 02 November 2015**

Abstract ID : **176**

Recent results from MINERvA

Content

Neutrino-nucleus interactions are an important source of systematic uncertaintiy for neutrino oscillation experiments as well as an interesting probe of nuclear physics. MINERvA is a dedicated neutrino-nucleus cross section experiment at Fermilab capable of measuring interactions on several different nuclei in the same detector and beam. Recent results from 2015 are presented, including pion and kaon production, quasielastic-like scattering of both muon and electron neutrinos, and ratios of deep inelastic scattering cross sections on carbon, iron and lead.

Primary author(s) : Mr. MARSHALL, Chris (University of Rochester)

Presenter(s) : Mr. MARSHALL, Chris (University of Rochester)

Track Classification : Neutrino Physics

Comments:
Minerva talk

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 02 November 2015**

Abstract ID : **177**

Neutrinos with Linear Seesaw Masses in an scenario with Broken B-L gauged symmetry

Content

We present an extension of Standard Model (SM) for explaining neutrino mass generation. Our model introduces (i) two scalar fields, H (an $SU(2)_L$ doublet) and χ (a SM singlet), (ii) three neutrinos per family ν_R, S, S', and (iii) the B-L gauge group, which assign charges according to the difference of barionic and leptonic number of particles. The Scalar Potential of the model allows that Vacuum Expectation Values (VEV) of Φ (the SM-Higgs), H and χ lies, respectively, in the range of 125GeV, 10^{-2}eV and 10TeV (we used naturalness arguments for justifying a so small VEV for H). In virtue of this, we obtained that active neutrinos acquire mass in the linear seesaw regime, in addition of six heavy neutrino mass states, five new massive scalars and a massive gauge boson Z'. The masses of all new particles are in the TeV scale. Finally, we show some prospects of the model.

Primary author(s) : Dr. DIB, Claudio (UTFSM); Ms. NEILL, Nicolás (UC Davis); Dr. MORENO, Gastón (UTFSM)

Presenter(s) : Dr. MORENO, Gastón (UTFSM)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **MORENO CHICHIZOLA, Gastón** on **Wednesday 04 November 2015**

Abstract ID : **178**

Phenomenology of the heavy quarkonium electric dipole transitions

Content

We use the complete expression for the $O(1/m^2)$ corrections to the quark-antiquark potential derived from QCD in terms of Wilson loop expectation values, and a mapping, valid at large distances, between those Wilson loop expectation values and correlators evaluated in the effective string theory (EST), to compute all $O(1/m^2)$ potentials at large distances. In particular, we present previously unknown results for the spin-independent part of the potential and confirm known results for the spin and momentum dependent parts. We discuss the power counting and numerical size of these new corrections. Using the EST long-distance contributions as the infrared completion of the potential we calculate the corrections induced by these to the heavy quarkonium wavefunction. Finally, considering these corrections, we evaluate the heavy quarkonium electric dipole (E1) transition rates at NLO in the relativistic expansion. We show that our results compare favorable with the experiment and provide predictions for the rates for which no experimental data is yet available.

Primary author(s) : Mr. MARTINEZ, Hector (TU Munich)

Presenter(s) : Mr. MARTINEZ, Hector (TU Munich)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **Mr. MARTINEZ, Hector** on **Monday 09 November 2015**

Abstract ID : **179**

Axions and The Grand Unifications Theory

Content

The standard model has demonstrated to be a framework consistent with recent experimental and constant checks. On the other hand, verification of atmospheric neutrino oscillations carried out by K. K. Hirata in 1989 [**1**] and T. Kajita [**11**] were in fact assimilated as a result that neutrinos have mass and indicate the real need to better understand the extensions to the standard model.
The next question might be what is the fundamental mechanism that gives neutrinos a mass. The hypothesis of grand unification is a natural step taken by those who trust in the power of predictability of symmetries and their representations.
The first attempt we should quote would be the Grand Unification Model proposed in 1974 by J. C. Pati and A. Salam [**2**], where, for the first time, the quark and lepton sectors were unified. In 1975, R.N. Mohapatra and J.C. Pati [**10**] established a model in which chiral symmetry would be exact in nature with the additional property of reducing the space of coupling constants of the Pati- Salam model. In the same year, 1974, H. Georgi and S.L. Glashow [**3**], also got an explanation for the quantization of electric charge and the unification of all the coupling constants.
In 1980, J. Chakrabarti and others have shown that the models with a large unification should not exceed SU (10) for reasons based on divergences in the ultraviolet limit [**4**]. Ever since, several experimental theoretical predictions clashed, it can be said that one of the main and most exciting consequences was the proton decay time [**5**].
A theoretical impasse which appeared in grand unifying theories is the so-significant difference existing between the coupling constants, such as the QCD and QED at a GeV scale. This difficulty has been by-passed in 1974 by H. Georgi, H.Quinn and S. Weinberg [**6**]: they proposed that the constants should not be absolute in nature; they can rather vary according to the Callan- Symanzik equations.
In 1975, T. Appelquist and T. J. Carazone [**7**] have proposed a theorem allowing to understand how the coupling constants should vary.
In 1980, N.P. Chang and A. Das [**8**] have proposed that, if the Lagrangian is renormalizable, just perform the description of the particles with lower mass, and the higher mass is of significant role the coupling constants.
Our main goal in this contribution is to pursue a discussion of grand-unified theories and their connection to the axion which is one of the issues still quite exciting in the understanding of strong CP violation. In this direction, we quote the 1990 paper by K. S. Babu and others [**9**], [**12**], where they indicate that the CP-violation problem resolution can also be achieved without the introduction of axionic or extra fields.
References
[**1**] K. K. Hirata. Phys. Rev. Lett. 63, 16 (1989) [**2**] A. Salam, J. C. Pati. Phys. Rev. D10, 275 (1974) [**3**] H. Georgi, S. L. Glashow. Phys. Rev. Lett. 32, 438 (1974) [**4**] J. Chakrabarti et al. Phys. Rev. D21, 3212 (1980) [**5**] J. Learned, F. Reines. Phys. Rev. Lett. 43, 907 (1979) [**6**] H. Georgi, H. Quinn and S. Weinberg. Phys. Rev. Lett. 33, 451 (1974) [**7**] T. Appelquist e J. Carazone. Phys. Rev. D11, 2856 (1975) [**8**] N. P. Chang, A. Das and J. P. Mercader. Phys. Lett. 39, 137 (1980) [**9**] K. S. Babu, Rabindra and N. Mohapatra. Phys. Rev. 41D, 4, 1286. [**10**] R. N. Mohapatra, J. C. Pati. Phys. Rev. D11, 2558 (1975) [**11**] T. Kajita, et al. Phys. Rev. Lett. 81, 1562 (1998) [**12**] H. Banerjee et al. Phys. Rev. Lett. 573B, 573 (2003)

Primary author(s) : Mr. RODOLFO, Luís (Brazilian Center for Physics Research)

Co-author(s) : Prof. HELAYËL, José (Brazilian Center for Physics Research)

Presenter(s) : Mr. RODOLFO, Luís (Brazilian Center for Physics Research)

Track Classification : Beyond SM

Comments:

This apresentation have a form the " Poster Apresentation " .
Thank you very much.

Status: SUBMITTED

Track Judgements:

Submitted by **RODOLFO, Luís** on **Wednesday 11 November 2015**

Abstract ID : **180**

Measurement of the relative branching fraction of $B^{\pm}\to K^{\pm}K^{+}K^{-}$ to $B^{\pm}\to K^{\pm}\pi^{+}\pi^{-}$.

Content

Using the data collected by LHCb experiment in 2012, we analyzed the $B^{\pm}\to K^{\pm}K^{+}K^{-}$ and $B^{\pm}\to K^{\pm}\pi^{+}\pi^{-}$ decays with the purpose of measuring its relative branching ratio. The selection of events was based in non-linear cuts Boosted Decision Tree involving topological variables common to both channels, in such a way as to cancel the systematic effects due to the selection process. The number of signal events was obtained though the adjustment of the three-body invariant mass distribution. In this context, a detailed study of the stability of the adjustment model was done. Finally, the efficiency were calculated from the Monte Carlo samples and weighted by the data, with the purpose of correcting the imperfections of the simulation. The branching ratio of $B^{\pm}\to K^{\pm}K^{+}K^{-}$ with respect to the $B^{\pm}\to K^{\pm}\pi^{+}\pi^{-}$ obtained is 0,632 ± 0,013.

Primary author(s) : Ms. LAVRA, Laís (Brazilian Center for Research in Physics)

Co-author(s) : Dr. MASSAFFERRI, André (Brazilian Center for Research in Physics)

Presenter(s) : Ms. LAVRA, Laís (Brazilian Center for Research in Physics)

Track Classification : Hadron Spectroscopy

Comments:
This presentation will be presented by poster.

Status: SUBMITTED

Track Judgements:

Submitted by **SOARES LAVRA, Lais** on **Wednesday 11 November 2015**

Abstract ID : **181**

Open heavy-flavour production in pp, p-Pb and Pb-Pb collisions with ALICE at the LHC

Content

ALICE (A Large Ion Collider Experiment) is the LHC experiment dedicated to the study of the Quark-Gluon Plasma (QGP). The QGP is a high energy-density state of strongly-interacting matter in which partons are deconfined. This state of matter can be studied experimentally only via heavy-ion (A-A) collisions where the necessary energy density for the phase transition to the QGP can be attained. Measurements of open heavy-flavour production are of particular interest since charm and beauty are dominantly produced in the early stages of the collision and they propagate through the high-density medium interacting with its constituents, thus probing the whole evolution of the system. In particular, the interaction of the particles with the QGP can lead to an energy loss that can be collisional or radiative. The nuclear modification factor, which is defined as the ratio of the p_T-differential yield measured in A-A collisions and the corresponding cross section in pp collisions multiplied by the average nuclear overlap function, is used to quantify medium effects and helps to understand the energy loss in the QGP. This same quantity is studied in a control experiment, in p-A collisions, to quantify cold nuclear matter effects (momentum broadening, energy loss and nuclear modification of the parton distribution functions (PDF), as shadowing/saturation). In addition to the nuclear modification factor, the azimuthal anisotropy of open heavy flavours in non-central heavy-ion collisions is also sensitive to the transport properties of the medium. The anisotropy is quantified by the second Fourier coefficient v_2, which is calculated based on the azimuthal angle of the particle momentum with respect to the reaction plane. With ALICE, open heavy-flavour production is studied via the measurement of heavy-flavour decay leptons (electrons and muons) and via D mesons reconstructed through their hadronic decay channels. We present the correspondent ALICE open heavy-flavour measurements in pp, p-Pb and Pb-Pb collisions at $\sqrt{s} = 7$ TeV, $\sqrt{s_{\rm NN}} = 5.02$ TeV and $\sqrt{s_{\rm NN}} = 2.76$ TeV, respectively.

Primary author(s) : JAHNKE, Cristiane (Universidade de Sao Paulo (BR))

Presenter(s) : JAHNKE, Cristiane (Universidade de Sao Paulo (BR))

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **JAHNKE, Cristiane** on **Saturday 14 November 2015**

Abstract ID : **182**

Latest results of heavy flavor measurement from the PHENIX Experiment at RHIC

Content

The production of heavy quarks (charm and bottom) is a good tool for investigating the hot and dense partonic medium created in Relativistic Heavy Ion Collider (RHIC). Due to their large masses, the production process of heavy quarks is essentially restricted to primordial nucleon-nucleon collisions. Thus, heavy quarks are clean probes to study the hot and dense matter because they carry information about the entire time-evolution of the medium.
The PHENIX experiment has studied many observables related open and closed heavy flavor. In recent years, the PHENIX has installed silicon vertex tracker both in central rapidity (VTX) and in forward rapidity (FVTX). Those two silicon trackers enhance the capability of heavy flavor measurement with precision tracking.
In this talk, the latest PHENIX heavy flavor results using VTX/FVTX will be presented.

Primary author(s) : ASANO, Hidemitsu

Presenter(s) : ASANO, Hidemitsu

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **ASANO, Hidemitsu** on **Saturday 14 November 2015**

Abstract ID : **183**

The CMS-TOTEM Precision Proton Spectrometer

Content

The CT-PPS (CMS-TOTEM Precision Proton Spectrometer) detector system consists of silicon tracking stations as well as timing detectors to measure both the position and direction of protons and their time-of-flight with precision of the order of 10 ps. They are located at around 200 m from the IP in the very forward region in both sides of CMS. CT-PPS is built to study Central Exclusive Production (CEP) in proton-proton collisions at high-luminosity LHC, including photon-photon production of W and Z boson pairs, high-pT jet production and searches for new resonances. In this presentation an overview of the CT-PPS project is given and its expected performance and sensitivity to different physics processes are discussed.

Primary author(s) : VILELA PEREIRA, Antonio (Universidade do Estado do Rio de Janeiro (BR))

Presenter(s) : VILELA PEREIRA, Antonio (Universidade do Estado do Rio de Janeiro (BR))

Track Classification : High-Energy QCD; Instrumentation and Detectors; Beyond SM

Comments:
This talk will be given on behalf of the CMS Collaboration. The corresponding conference committee has been contacted.

Status: SUBMITTED

Track Judgements:

Submitted by **VILELA PEREIRA, Antonio** on **Sunday 15 November 2015**

Abstract ID : **184**

A natural explanation for large neutrino mixing

Content

The origin of small mixing among quarks and a large mixing in the neutrino sector poses an intriguing open question. Among many approaches to answer this question the 'high scale mixing unification' (HSMU) hypothesis is a natural one. The central idea of HSMU hypothesis is that the quark and leptonic mixing angles can be unified at some high scale, typically at GUT scale, either due to some quark-lepton symmetry or some other underlying mechanism. The large leptonic mixing angles are obtained through the renormalization group evolution of the corresponding mixing parameters from the unification scale to the low scale. This hypothesis nicely explains the mixing pattern in the neutrino sector including the recent observation of nonzero but small value of θ_{13}. I will try to elaborate the HSMU hypothesis in the context of both Dirac as well as Majorana neutrinos and discuss the phenomenology of various parameters.

Primary author(s) : Dr. GUPTA, Saurabh (USP - Universidade de Sao Paulo)

Co-author(s) : Prof. RAJASEKARAN, G (The Institute of Mathematical Sciences, Chennai, India); Dr. SRIVASTAVA, Rahul (The Institute of mathematical Sciences, Chennai, India); Dr. ABBAS, Gauhar (IFIC, Universitat de València-CSIC, València, Spain)

Presenter(s) : Dr. GUPTA, Saurabh (USP - Universidade de Sao Paulo)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **Dr. GUPTA, Saurabh** on **Monday 16 November 2015**

Abstract ID : **185**

Baryogenesis from symmetry principle

Content

Symmetry is a double-edged sword in the context of baryogenesis. On the one hand, it prevents the generation of an asymmetry. On the other hand, it also protects an existing asymmetry. Provided an effective symmetry can be dynamically broken at some point in the early Universe and then subsequently conserved, an asymmetry will prevail. In this talk, I will discuss a formalism based on symmetry which allows one to express asymmetries of all the particles in terms of conserved charges is developed. The manifestation of symmetry allows one to easily determine the viability of a baryogenesis scenario and also to identity the different roles played by the symmetry.

Primary author(s) : Dr. FONG, Chee Sheng (Universidade de São Paulo)

Presenter(s) : Dr. FONG, Chee Sheng (Universidade de São Paulo)

Track Classification : Beyond SM; Astroparticles

Status: SUBMITTED

Track Judgements:

Submitted by **Dr. FONG, Chee Sheng** on **Tuesday 17 November 2015**

Abstract ID : **186**

Recent Results from the NUMI Off-axis electron Neutrino Appearance (NOvA) Experiment

Content

The NUMI Off-axis electron Neutrino Appearance (NOvA) experiment was built to shed light on neutrino mixing parameters, the neutrino mass ordering and perhaps give indications of CP violation in neutrino sector. With the completion of the experiment construction just over a year ago, we present recent measurements from NOvA on neutrino oscillations and cross sections and compare these results with those from other experiments.

Primary author(s) : TESAREK, Richard (Fermilab)

Presenter(s) : TESAREK, Richard (Fermilab)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **TESAREK, Richard** on **Tuesday 17 November 2015**

Abstract ID : **187**

Measurements of directed, elliptic, and triangular flow in Cu+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV using the PHENIX detector at RHIC

Content

Measurements of the azimuthal anisotropy of particle emission in high-energy heavy ion collisions are an important probe of the properties of the quark-gluon plasma. The study of collisions between asymmetric systems can offer additional insights into the formation and evolution of the medium produced in these collision since these systems can have non-zero odd-order moments in the average transverse distribution of participants. Such moments are particularly sensitive to fluctuations in the initial geometry of the collisions. The PHENIX experiment at RHIC has measured charged particle production in Cu+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. We present results on v_1 (directed flow), v_2 (elliptical flow), and v_3 (triangular flow) for inclusive and identified charged hadrons produced at midrapidity using event-plane techniques. These results are discussed in the context of various theoretical predictions.

Primary author(s) : Prof. GREENE, Senta (Vanderbilt University)

Presenter(s) : Prof. GREENE, Senta (Vanderbilt University)

Track Classification : Heavy Ion collisions

Comments:
For the PHENIX collaboration

Status: SUBMITTED

Track Judgements:

Submitted by **GREENE, Victoria** on **Tuesday 17 November 2015**

Abstract ID : **188**

Pentaquarks from intrinsic charms in Λ_b decays

Content

In this talk, I will present the study of the three-body Λ_b decays of $\Lambda_b \to J/\psi p M$ with $M = K^-$ and π^-. The two new states $\mathcal{P}_{c1} \equiv \mathcal{P}_c(4380)^+$ and $\mathcal{P}_{c2} \equiv \mathcal{P}_c(4450)^+$ observed recently as the resonances in the $J/\psi p$ invariant mass spectrum of $\Lambda_b \to J/\psi p K^-$ can be identified to consist of five quarks, $uudc\bar{c}$, being consistent with the existence of the pentaquark states. We propose that the $\mathcal{P}_{c1,c2}$ productions are mainly from the charmless Λ_b decays through $b \to \bar{u}us$, in which the $c\bar{c}$ content in $\mathcal{P}_{c1,c2}$ arises from the intrinsic charms within the Λ_b baryon. We hence predict the observables related to the branching ratios and the direct CP violating asymmetries to be $\mathcal{B}(\Lambda_b \to \pi^-(\mathcal{P}_{c1,c2} \to)J/\psi p)/\mathcal{B}(\Lambda_b \to K^-(\mathcal{P}_{c1,c2} \to)J/\psi p) = 0.58 \pm 0.05$, $\mathcal{A}_{CP}(\Lambda_b \to \pi^-(\mathcal{P}_{c1,c2} \to)J/\psi p) = (-7.4 \pm 0.9)\%$, and $\mathcal{A}_{CP}(\Lambda_b \to K^-(\mathcal{P}_{c1,c2} \to)J/\psi p) = (+6.3 \pm 0.2)\%$, which can alleviate the inconsistency between the theoretical expectations from the three contributions in the doubly charmful Λ_b decays and the observed data.

Primary author(s) : Mr. HSIAO, Yu-kuo (National Center for theoretical sciences)

Presenter(s) : Mr. HSIAO, Yu-kuo (National Center for theoretical sciences)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Thursday 19 November 2015**

Abstract ID : **189**

Rapidity evolution of gluon TMDs from low to moderate x

Content

We study how the rapidity evolution of gluon transverse momentum dependent distribution changes from nonlinear evolution at small x to linear evolution at moderate x.

Primary author(s) : BALITSKY, Ian (JLab/ODU)

Presenter(s) : BALITSKY, Ian (JLab/ODU)

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **BALITSKY, Ian** on **Thursday 19 November 2015**

Abstract ID : **190**

Recent results from the CMS experiment

Content

In 2015 the CMS experiment at the CERN LHC has collected several inverse femtobarns of proton-proton collisions at 13 TeV centre-of-mass energy. The data have been used to search for new phenomena that could "turn on" at the higher energy, or made more evident by their increased cross section with respect to 8 TeV collisions previously analyzed in Run 1. A number of new results improve our exclusion of new physics models, as well as improve the measurement of standard model properties. The presentation will highlight the recent results and the future plans of the experiment.

Primary author(s) : DORIGO, Tommaso (Universita e INFN, Padova (IT))

Presenter(s) : DORIGO, Tommaso (Universita e INFN, Padova (IT))

Track Classification : Higgs Physics; High-Energy QCD; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **DORIGO, Tommaso** on **Thursday 19 November 2015**

Abstract ID : **191**

Recent results from the T2K experiment

Content

T2K (Tokai2Kamioka) is an experimental facility measuring neutrino oscillations. It is located in Japan and consists of a muon neutrino beam source and a near detector in J-PARC laboratory in Tokai, Ibaraki and a far detector, Super-Kamiokande, located near Kamioka, Gifu, 295 km away from the beam source. Its main goal is to measure electron (anti)neutrino appearance from muon (anti)neutrino beam, as well as observation of muon (anti)neutrino dissapearance. Existence of a near detector, ND280, allows for unoscillated beam monitoring and measurement of cross sections of several types of neutrino interactions for neutrino energies of the order of 1 GeV. The talk will present recent results obtained by the experiment (with an emphasis on recent antineutrino measurements) and current limits on oscillation parameters derived from these results.

Primary author(s) : Dr. PRZEWLOCKI, Pawel (NCBJ)

Presenter(s) : Dr. PRZEWLOCKI, Pawel (NCBJ)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Thursday 19 November 2015**

Abstract ID : **192**

Deuteron electromagnetic form factors in holographic QCD

Content

We present a high-quality description of the deuteron electromagnetic form factors in a soft-wall AdS/QCD approach [1]. We propose an effective action describing the dynamics of the deuteron in the presence of an external vector field. Based on this action the deuteron electromagnetic form factors are calculated, displaying the correct (1/Q2)**5 power scaling for large Q2 values. This finding is consistent with quark counting rules and the earlier observation that this result holds in confining gauge/gravity duals. The Q2 dependence of the deuteron form factors is defined by a single and universal scale parameter kappa, which is fixed from data.

[1] T. Gutsche, V. E. Lyubovitskij, I. Schmidt and A. Vega, "Nuclear physics in soft-wall AdS/QCD: Deuteron electromagnetic form factors," Phys. Rev. D 91, 114001 (2015).

Primary author(s) : LYUBOVITSKIJ, Valery (Tuebingen University, Germany); GUTSCHE, Thomas (Tuebingen University, Germany); SCHMIDT, Ivan (Universidad Tecnica Federico Santa Maria, Valparaiso, Chile); VEGA, Alfredo (Universidad de Valparaiso, Valparaiso, Chile)

Presenter(s) : LYUBOVITSKIJ, Valery (Tuebingen University, Germany)

Track Classification : Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **Prof. LYUBOVITSKY, Valery** on **Thursday 19 November 2015**

Abstract ID : **193**

Defying Lorentz invariance with neutrinos

Content

Lorentz symmetry is a cornerstone of modern physics. As the spacetime symmetry of special relativity, Lorentz invariance is a basic component of the standard model of particle physics and general relativity, which to date constitute our most successful descriptions of nature. Deviations from exact symmetry would radically change our view of the universe and current experiments allow us to test the validity of this assumption. In this talk, the general framework for studying Lorentz and CPT violation will be reviewed and experimental searches of the key signatures from low-energy beta decays to high-energy astrophysical neutrinos will be presented.

Primary author(s) : DIAZ, Jorge S. (Karlsruhe Institute of Technology)

Presenter(s) : DIAZ, Jorge S. (Karlsruhe Institute of Technology)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **DIAZ, Jorge S.** on **Thursday 19 November 2015**

Abstract ID : **194**

First Atlas Results from Run2

Content

The 2nd LHC run has started in June 2015 with a pp centre-of-mass collision energy of 13 TeV, and ATLAS has taken first data at this new energy. In this talk first physics results from run-2 are presented.

Primary author(s) : WAHLBERG, Hernan Pablo (Universidad Nacional de La Plata (AR))

Presenter(s) : WAHLBERG, Hernan Pablo (Universidad Nacional de La Plata (AR))

Track Classification : Higgs Physics; High-Energy QCD; Beyond SM

Comments:
I will give the talk on behalf of the ATLAS Collaboration.
Abstract is still preliminar, it may still be slightly modified.

Status: SUBMITTED

Track Judgements:

Submitted by **WAHLBERG, Hernan Pablo** on **Thursday 19 November 2015**

Abstract ID : **195**

JUNO: New Generation Reactor Neutrino Experiment

Content

The Jiangmen Underground Neutrino Observatory (JUNO) is a new multipurpose reactor neutrino experiment being built in China. The primary goal is resolving the neutrino mass hierarchy and making a precise measurement of several oscillation parameters by detecting reactor anti-neutrinos with a 20-kt liquid scintillator detector at a baseline of 53 km. An unprecedented performance, an overburden of 1800 m.w.e., and an active muon veto system, will make it possible to collect the world's largest reactor anti-neutrino sample and to reach an energy resolution of 3%. JUNO will also provide rich opportunities for observing supernova neutrinos, atmospheric neutrinos, solar neutrinos, and geoneutrinos.

Primary author(s) : MALYSHKIN, Yury (Pontifical Catholic University of Chile)

Presenter(s) : MALYSHKIN, Yury (Pontifical Catholic University of Chile)

Track Classification : Neutrino Physics

Comments:
on behalf of the JUNO collaboration

Status: SUBMITTED

Track Judgements:

Submitted by **MALYSHKIN, Yury** on **Thursday 19 November 2015**

Abstract ID : **196**

Two and three-particle production in DIS at small x

Content

Abstract: We calculate the inclusive 3-parton production cross section in DIS at small x using the gluon saturation and Color Glass Condensate formalism. We discuss the signatures of gluon saturation in azimuthal angular correlations of the away side partons.

Primary author(s) : Mr. JALILIAN-MARIAN, Jamal (Baruch College)

Presenter(s) : Mr. JALILIAN-MARIAN, Jamal (Baruch College)

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **JALILIAN-MARIAN, Jamal** on **Thursday 19 November 2015**

Abstract ID : **197**

Interpretations of IceCube High Energy Neutrino Events

Content

The IceCube experiment (IC) takes advantage of the transparent and abundant ice present at the Earth South Pole in order to be able to capture the tiny flux of neutrinos which is expected at very high energies. Indeed, given the huge dimensions of the detector ice volume it is possible to detect incoming neutrinos with energies covering from the TeV scale up to the tens of PeV. At very high energies the contribution of atmospheric neutrinos is expected to be sub-dominant in comparison to the flux of neutrinos from astrophysical sources, which opens the window to neutrino astronomy with IC. Indeed, after three years of time exposure, IC has confirmed the existence of astrophysical neutrinos with more than five-sigma confidence level. This crucial piece of information allows us to study a variety of astrophysical scenarios of neutrino production, including unstable Dark Matter scenarios, but also some fundamental properties in the neutrino sector which are still unclear. Although the statistics is still insufficient in order to obtain clear answers at the moment, it is expected that in the future this experiment is going to increase their detection sensibility (time exposure, effective volume and performance of detection) at least one order of magnitude. Therefore, we should be confident that new and interesting observations, with a deep impact on fundamental physics, are still to come.

Primary author(s) : Dr. PANES, Dr. Boris (Universidade de Sao Paulo)

Presenter(s) : Dr. PANES, Dr. Boris (Universidade de Sao Paulo)

Track Classification : Neutrino Physics; Dark Matter searches; Astroparticles

Status: SUBMITTED

Track Judgements:

Submitted by **Dr. PANES, Dr. Boris** on **Thursday 19 November 2015**

Abstract ID : **198**

Odd- and even-parity charm and bottom mesons in heavy hadron chiral perturbation theory

Content

We study the masses of the low-lying charm and bottom mesons within the framework of heavy-hadron chiral perturbation theory. We work to third order in the chiral expansion, where meson loops contribute. In contrast to previous approaches, we use physical meson masses in evaluating these loops. This ensures that their imaginary parts are consistent with the observed widths of the D-mesons. The lowest odd- and even-parity, strange and nonstrange mesons provide enough constraints to determine only certain linear combinations of the low-energy constants (LECs) in the effective Lagrangian. We comment on how lattice QCD could provide further information to disentangle these constants. Then we use the results from the charm sector to predict the spectrum of odd- and even-parity of the bottom mesons. The predicted masses from our theory are in good agreement with experimentally measured masses for the case of the odd-parity sector. For the even-parity sector, the B-meson states have not yet been observed; thus, our results provide useful information for experimentalists investigating such states. The near degeneracy of nonstrange and strange scalar B mesons is confirmed in our predictions using HHChPT. Finally, we show why previous approaches of using HHChPT in studying the mass degeneracy in the scalar states of charm and bottom meson sectors gave unsatisfactory results.

Primary author(s) : Dr. ALHAKAMI, Mohammad (KACST)

Presenter(s) : Dr. ALHAKAMI, Mohammad (KACST)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Thursday 19 November 2015**

Abstract ID : **200**

Neutrino Physics

Content

The 2015 Nobel Prize was awarded for the discovery of neutrino oscillations with the Super-Kamiokande and SNO experiments. Beyond those discoveries, the past two decades have brought tremendous new information about the properties of neutrinos. But there are still outstanding puzzles. In this talk I will summarize the current status of neutrino physics and highlight future experimental opportunities.

Primary author(s) : SCHOLBERG, Kate (Duke University)

Presenter(s) : SCHOLBERG, Kate (Duke University)

Track Classification : Neutrino Physics

Comments:
The topic can be narrowed if desired (just oscillations, some some sectors, etc.)

Status: SUBMITTED

Track Judgements:

Submitted by **SCHOLBERG, Kate** on **Thursday 19 November 2015**

Abstract ID : **201**

holographic renormalization of the Dirac Oscillator

Content

The Dirac Oscillator is a relativistic Quantum system proposed some years ago in order to have a simple effective model of nuclear interaction. It has several interesting properties, among them, is that the system can be exactly solved, it conserves angular momentum, it has an internal supersymmetry, it is conformal invariant and conserves angular momentum. What we propose in this talk is to study a model inspired in the Dirac Oscillator, where we introduce a fermion field in the AdS bulk metric with an interaction term similar to the one in the Dirac Oscillator. The dual QFT has then an interaction that mimics confinment, one of the motivations of the original model. We study then its renormalized interaction via the Ads/CFT techniques.

Primary author(s) : Dr. MARTÍNEZ Y ROMERO, Rodolfo Patricio (Facultad de Ciencias, UNAM)

Presenter(s) : Dr. MARTÍNEZ Y ROMERO, Rodolfo Patricio (Facultad de Ciencias, UNAM)

Track Classification : Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **PATRICIO MARTÍNEZ Y ROMERO, Rodolfo** on **Thursday 19 November 2015**

Abstract ID : **202**

Progress in reconstructed jet measurements with the PHENIX detector at RHIC

Content

Measurements of the particle jets arising from a hard scattering in collisions involving nuclei are valuable experimental tools for understanding the physics of large and small systems. In nucleus-nucleus collision systems, they are sensitive probes of the energy loss experienced by the showers of hard-scattered partons that traverse the hot QCD medium created in these collisions. In small systems, such as in proton- or deuteron-nucleus collisions, they are useful benchmarks of the effects of the nuclear environment on the parton densities. Intriguingly, the latter have revealed that the traditional frameworks of understanding the collision geometry of small systems break down in certain hard-scattering kinematic regimes. This talk will present the latest measurements of fully reconstructed jet production rates in 200 GeV deuteron-gold and copper-gold collisions performed with the PHENIX detector at Relativistic Heavy Ion Collider. Such measurements are important early steps towards a robust experimental jet program at the sPHENIX detector at RHIC.

Primary author(s) : PEREPELITSA, Dennis Vadimovich (Brookhaven National Laboratory (US))

Presenter(s) : PEREPELITSA, Dennis Vadimovich (Brookhaven National Laboratory (US))

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **PEREPELITSA, Dennis Vadimovich** on **Thursday 19 November 2015**

Abstract ID : **203**

Signatures from Scalar Dark Matter with a Vector-like Quark Mediator

Content

I will present a comprehensive study of a model where the dark matter is composed of a singlet real scalar that couples to the Standard Model predominantly via a Yukawa interaction with a light quark and a colored vector-like fermion. A distinctive feature of this scenario is that thermal freeze-out in the early universe may be driven by annihilation both into gluon pairs at one-loop (gg) and by virtual internal Bremsstrahlung of a gluon ($qq^{-}g$). Such a dark matter candidate may also be tested through direct and indirect detection and at the LHC; viable candidates have either a mass nearly degenerate with that of the fermionic mediator or a mass above about 2 TeV.

Primary author(s) : TYTGAT, Michel (Université Libre de Bruxelles)

Co-author(s) : IBARRA, Alejandro; LOPEZ HONOREZ, Laura (Vrije Universiteit Brussel); WILD, Sebastian (TU Munich)

Presenter(s) : TYTGAT, Michel (Université Libre de Bruxelles)

Track Classification : Beyond SM; Dark Matter searches; Astroparticles

Status: SUBMITTED

Track Judgements:

Submitted by **TYTGAT, Michel** on **Thursday 19 November 2015**

Abstract ID : **204**

Are the Nuclear Parton Distributions the same for Neutrino - Nucleus and Charged Lepton - Nucleus Interactions?

Content

The need for nuclear parton distributions in neutrino nucleus interactions is intensifying as the required accuracy of neutrino oscillation experiments increases. When compared to charged-lepton F_2 ratios, the nCTEQ collaboration has found a vey different behavior when taking the ratio of the NuTeV Fe neutrino and anti-neutrino F_2 structure function to bare nucleon F_2. Recent results from the MINERvA experiment nuclear target ratios are also intriguing. The details of this study will be presented.

Primary author(s) : MORFIN, Jorge G. (Fermilab)

Presenter(s) : MORFIN, Jorge G. (Fermilab)

Track Classification : Neutrino Physics; Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **205**

New Perspectives for Hadron Physics from Light-Front Holography, AdS/QCD, and Superconformal Algebra

Content

Light-front holography provides a precise relation between the bound-state amplitudes in the fifth dimension of AdS space and the boost-invariant light-front wavefunctions describing the internal structure of hadrons in physical space-time. The resulting valence Fock-state wavefunctions of the light-front QCD Hamiltonian satisfy a relativistic equation of motion with an effective confining potential. If one requires that the effective action which underlies the QCD Lagrangian to remain conformally invariant and extends the formalism of de Alfaro, Fubini and Furlan to light front Hamiltonian theory, the potential has the unique form of a harmonic oscillator potential, and a mass gap arises. The result is a nonperturbative relativistic light-front wave equation – the Light-Front Schroedinger Equation – which incorporates color confinement and other essential spectroscopic and dynamical features of hadron physics, including a massless pion for zero quark mass and linear Regge trajectories with the same slope in the radial quantum number n and orbital angular momentum L. One can also construct an effective QCD light-front Hamiltonian for both mesons and baryons based on superconformal algebra. The resulting baryon trajectories have the same slope in n and L as the mesons. The superconformal construction is shown to be equivalent to a semi-classical approximation to light-front QCD and its embedding in AdS space. The specific breaking of conformal invariance uniquely determines the effective confinement potential. The generalized supercharges connect the baryon and meson spectra to each other in a remarkable manner. The mesons and baryons have the same mass if one identifies the relative orbital angular momentum L_M of the $q\bar{q}$ mesons with the relative internal orbital angular momentum L_B of the quark-scalar diquark baryons, where $L_M = L_B + 1$. We also show how the mass scale underlying confinement and hadron masses determines the scale controlling the evolution of the perturbative QCD coupling. The relation between scales is obtained by matching the nonperturbative dynamics, as described by an effective conformal theory mapped to the light-front and its embedding in AdS space, to the perturbative QCD regime computed to four-loop order. One derives a running QCD coupling $\alpha_s(Q^2)$ defined at all momenta which is consistent with the measured effective couping defined from the Bjorken sum rule and the measured perturbative scale $\Lambda_{\overline{MS}}$.

Primary author(s) : BRODSKY, Stanley J. (SLAC National Accelerator Laboratory, Stanford University)

Co-author(s) : Prof. DOSCH, Hans Guenter (University of Heidelberg); Prof. DE TERAMOND, Guy (University of Costa Rica); Dr. DEUR, Alexandre (Jefferson Laboratory)

Presenter(s) : BRODSKY, Stanley J. (SLAC National Accelerator Laboratory, Stanford University)

Track Classification : Hadron Spectroscopy; Hadron Structure; High-Energy QCD; Nonperturbative QCD; Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **BRODSKY, Stanley J.** on **Friday 20 November 2015**

Abstract ID : **206**

On pentaquark production

Content

Recently LHCb collaboration discovered charmed pentaquarks in weak decays of Λ_b mesons, $\Lambda_b \to J/\psi\, pM$. In this talk we argue that charmed pentaquarks can be produced in strong interactions of heavy ions. We argue that the dynamics of $\bar{c}c$ pair is controlled by a perturbative QCD, enabling us to study $\bar{c}c$ pair dynamics inside a pentaquark. We estimate the cross-section of pentaquark production with this mechanism and find a sizeable result both when the $\bar{c}c$ pair is in color singlet as well as in color octet states.

Primary author(s) : Prof. SCHMIDT, Ivan (Universidad Santa María); SIDDIKOV, Marat (Universidad Santa Maria)

Presenter(s) : SIDDIKOV, Marat (Universidad Santa Maria)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **SIDDIKOV, Marat** on **Friday 20 November 2015**

Abstract ID : **207**

Dalitz plot in the meson dominance model for the $\tau - \rightarrow K\ 2 *- \pi\ 0\ \nu\ \tau$ decay

Content

In this work we use a meson dominance model (MDM) in order to obtain the square mass distribution m 2 (K 2 $*$ π) and m 2 (K 2 $*$ ν τ) of the $\tau - \rightarrow$ K 2 $*-$ π 0 ν τ decay. These functions are simulated using the Monte-Carlo method to get a Dalitz plot that allows to elucidate the properties of this decay.

Primary author(s) : Mr. MORALES, Cesar (Universidad del Tolima)

Presenter(s) : Mr. MORALES, Cesar (Universidad del Tolima)

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **208**

Suppression of net particle production from finite fermion mass: A real-time CME simulation

Content

How do flavor degrees of freedom emerge in the quark-gluon plasma formed at heavy ion collisions is a challenging open question for both experiment and theory. In this work as a mean to approach this problem we study fermion production under a background electromagnetic field at real time. Using a simple enough time profile for such external electromagnetic field, allows us to define a proper Bogoliubov transformation between in and out states. In this way, we take on the problem of fermion production by numerically evolving the wave functions in real time and computing the proper observables, we obtained the net currents produced. In particular, the chiral magnetic effect is simulated considering finite parallel electric and magnetic components, exploring thus, its CP-odd domain. The net electric current produced by the chiral magnetic effect is computed for different values with a damping for the fermion mass, an attempt to study how transient the effect at real time is discussed.

Primary author(s) : MORALES, Pablo (The University of Tokyo)

Presenter(s) : MORALES, Pablo (The University of Tokyo)

Track Classification : Non-perturbative QCD

Comments:
Presentation or poster either is fine with me

Status: SUBMITTED

Track Judgements:

Submitted by **MORALES, Pablo** on **Friday 20 November 2015**

Abstract ID : **209**

Light-cone QCD sum rules for soft contribution to exclusive Drell-Yan process $\pi^- p \to \ell^+ \ell^- n$

Content

Exclusive Drell-Yan process, $\pi^- p \to \ell^+ \ell^- n$, may be measured using the high-intensity pion beams at J-PARC, and its QCD description is complementary to that for the deeply virtual meson production, $\gamma^* p \to \pi N$, at e.g., JLAB. The leading hard exclusive amplitude for exclusive Drell-Yan process was obtained by E.R. Berger, M. Diehl, and B. Pire [Phys. Lett. B 523 (2001) 265] in terms of the partonic subprocess convoluted with the relevant nonperturbative functions, the nucleon generalized parton distributions (GPDs) and the pion distribution amplitudes, and, recently, subleading amplitudes, suppressed by the inverse powers of the dilepton mass Q, have also been calculated by S. V. Goloskokov and P. Kroll [Phys.Lett. B748 (2015) 323]. However, those predictions based on the QCD factorization approach still seem to have large uncertainties that originate from the treatment of the pion-pole contribution arising in the relevant GPDs in the ERBL region, the parton transverse momentum to regularize the endpoint singularities, the so-called soft-overlap mechanism, etc. These effects related to "soft contribution" important at J-PARC kinematics are not directly accessible in the usual framework for QCD factorization of the hard exclusive amplitudes. We study the exclusive Drell-Yan process constructing the light-cone QCD sum rules for the corresponding exclusive amplitudes, which could allow us to estimate the relevant soft contributions in a largely model-independent way, making use of dispersion relations and quark-hadron duality.

Primary author(s) : TANAKA, Kazuhiro

Presenter(s) : TANAKA, Kazuhiro

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **TANAKA, Kazuhiro** on **Friday 20 November 2015**

Abstract ID : **210**

Recent Results of the Daya Bay Experiment

Content

Using six powerful nuclear reactors and eight identical detectors placed at near and far locations, the Daya Bay Reactor Antineutrino Experiment is able to measure the neutrino oscillation parameters θ_{13} and $|\Delta m^2_{ee}|$ with unprecedented precision. In this talk I will present the latest oscillation results obtained with a 621-day dataset consisting of more than two million antineutrino interactions. I will also present other recent results, such as an independent measurement of θ_{13} using a sample of events where neutrons were captured on hydrogen, a high-statistics measurement of the flux and spectral shape of antineutrinos from nuclear reactors, and a search for sterile neutrino mixing in the $10^{-3}\ eV^2 < |\Delta m^2_{41}| < 0.3\ eV^2$ range.

Primary author(s) : VIAUX MAIRA, Nicolas (Pontificia Univ. Catolica de Chile (CL))

Presenter(s) : VIAUX MAIRA, Nicolas (Pontificia Univ. Catolica de Chile (CL))

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **VIAUX MAIRA, Nicolas** on **Friday 20 November 2015**

Abstract ID : **211**

QCD at high temperatures

Content

I will review the current status of QCD calculations at high temperatures, including the lattice studies of chiral and deconfinement transition, equation of state and fluctuations of conserved charges. I will show the comparison of the lattice and the weak coupling calculations for different quantities, in the temperature region where the later may be applicable. Furthermore, I will discuss quarkonium spectral functions at finite temperature which are relevant for understanding quarkonium production in heavy ion collisions.

Primary author(s) : PETRECZKY, Peter (BNL)

Presenter(s) : PETRECZKY, Peter (BNL)

Track Classification : Heavy Ion collisions

Comments:
This will a plenary overview talk

Status: SUBMITTED

Track Judgements:

Submitted by **PETRECZKY, Peter** on **Friday 20 November 2015**

Abstract ID : **212**

The BK and BMS equations in high energy particle and nuclear physics

Content

We review the BMS and BK equations and observe that they are essentially the same. Criteria for these equations to apply are given and examples worked out.

Primary author(s) : MUELLER, Alfred (Columbia University)

Presenter(s) : MUELLER, Alfred (Columbia University)

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **MUELLER, Alfred** on **Friday 20 November 2015**

Abstract ID : **213**

FORMATION AND EVOLUTION OF QUARK-GLUON PLASMA

Content

We study the formation and evolution of quark gluon plasma and quark hadron phase transition. The phenomenological model predicts the order of phase transition. The parametrization factors give the significant contribution in high energy heavy ion collision. The results are in good agreement with the theoretical and experimental results

Primary author(s) : Dr. KUMAR, Yogesh (University of Delhi)

Presenter(s) : Dr. KUMAR, Yogesh (University of Delhi)

Track Classification : High-Energy QCD; Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **KUMAR, Yogesh** on **Friday 20 November 2015**

Abstract ID : **214**

A new detector at RHIC, sPHENIX goals and status

Content

The study of heavy-ion collisions, which create a new form of matter called the Quark Gluon Plasma (QGP), where quarks and gluons are no longer confined into nucleons, forming a nearly ideal strongly interacting fluid is on the frontier QCD studies. The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Lab (BNL) has had a long and successful program of QGP study since 2001, with many upgrades that have increased the delivered luminosity considerably in the last decade. The sPHENIX proposal is for a second generation experiment at RHIC, which will take advantage of the increased luminosity, and allow measurements of jets, jet correlations and upsilons, with a kinematic reach that will overlap with measurements made at the large hadron collider (LHC). Complementary measurements at RHIC and at the LHC probe the QGP at different temperatures and densities, which are necessary to determine the temperature dependence of transport coefficients of the quark-gluon plasma. The sPHENIX detector will have large acceptance electromagnetic and hadronic calorimetry, as well as precision tracking, which are necessary for precision jet and upsilon observables. The experiment will enable a program of systematic measurements at RHIC, with a detector capable of acquiring a large sample of events in p+p, p+A, and A+A collisions. This talk will outline the key measurements enabled by the new detector, and status of the project itself.

Primary author(s) : REED, Rosi Jan (Wayne State University (US))

Presenter(s) : REED, Rosi Jan (Wayne State University (US))

Track Classification : Heavy Ion collisions; Future experiments

Comments:

In order to make it back to the US for another workshop I need to attend, I am leaving on the night of the 10th. So if my talk could be sometime 1/6-1/10, that would be great! Thank you for your consideration.

Status: SUBMITTED

Track Judgements:

Submitted by **REED, Rosi Jan** on **Friday 20 November 2015**

Abstract ID : **215**

Nuclear EMC Effect for Electron and Neutrino DIS

Content

We briefly review the key experimental observations on nuclear effects in the DIS structure functions as well as major mechanisms responsible for nuclear corrections in different kinematic regions of Bjorken x. Then we outline a model of nuclear DIS which incorporates all major nuclear corrections and discuss its performance in the description of nuclear DIS with electrons and neutrino as well as Drell-Yan reactions [1-4].
References:
[1] S. A. Kulagin and R. Petti, Global study of nuclear structure functions, Nucl. Phys. A765 (2006) 126, http://inspirehep.net/record/668239 [2] S. A. Kulagin and R. Petti, Neutrino inelastic scattering off nuclei, Phys. Rev. D76 (2007) 094023, http://inspirehep.net/record/745742 [3] S. A. Kulagin and R. Petti, Structure functions for light nuclei, Phys. Rev. C82 (2010) 054614, http://inspirehep.net/record/852440 [4] S. A. Kulagin and R. Petti, Nuclear parton distributions and the Drell-Yan process, Phys. Rev. C90 (2014) 045204, http://inspirehep.net/record/1295705

Primary author(s) : Dr. KULAGIN, Sergey (INR)

Presenter(s) : Dr. KULAGIN, Sergey (INR)

Track Classification : Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **216**

Streaking UED Beams with an RF Deflecting Cavity

Content

At the Particle Beam Physics Laboratory (PBPL) at UCLA, we will be implementing a radio-frequency (RF) deflecting cavity to provide images with resolution as fine as 100 fs of a diffracted electron beam as well as perform beam diagnostics. A direct and sophisticated technique, the RF cavity will manipulate the beam's distribution in phase space so as to create a linear correlation between the longitudinal axis of the beam and a transverse coordinate. This process of "streaking" the electron beam has unique advantages for measurement of certain atomic scale, ultrafast processes in specific materials and allows the probe electron beam to remain comparatively long (10's of ps), and contain a large number of electrons (˜108).

Primary author(s) : Mrs. FABBRI, Siara (UCLA)

Presenter(s) : Mrs. FABBRI, Siara (UCLA)

Track Classification : Instrumentation and Detectors

Comments:
Accelerator physics. poster

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **217**

Simple estimates of the masses of pentaquarks with hidden beauty or strangeness

Content

The masses of cryptoexotic pentaquarks with hidden beauty are estimated phe- nomenologically using the results by the LHCb collaboration which discovered recently the cryptoexotic pentaquarks with hidden charm. The expected masses of the hidden beauty pentaquarks are about 10.8 GeV and 10.7 GeV in the limit of some kind of heavy quark symmetry. The states with hidden strangeness, considered in similar way, have masses above 2 Gev, by several hundreds of M eV higher than states discussed previously in connection with the relatively light positive strangeness pentaquark $\vartheta+$. Comparison with predictions of the molecular-type models is made. The results ob- tained are in fair agreement with models of isospin (pion) exchange between flavored baryons and anti-flavored vector mesons, proposed by Karliner and Rosner.

Primary author(s) : Dr. KOPELIOVIH, Vladimir (INR, Moscow)

Co-author(s) : POTASHNIKOVA, Irina (UTFSM)

Presenter(s) : Dr. KOPELIOVIH, Vladimir (INR, Moscow)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **218**

Dark Matter from the vector of SO(10)

Content

SO(10) grand unified theories can ensure the stability of new particles in terms of the gauge group structure itself, and in this respect are well suited to accommodate dark matter (DM) candidates in the form of new stable massive particles. We introduce new fermions in two vector 10 representations, and we show that when SO(10) is broken to the standard model by suitable tensor representations, the resulting lighter mass eigenstate is a neutral, stable Dirac fermion, that has only non-diagonal Z(L,R) neutral current couplings to another heavier neutral state. For a sufficiently large mass splitting, inelastic light-to-heavy scatterings are kinematically forbidden, and all limits from direct detection searches are evaded.

Primary author(s) : NARDI, Enrico (LNF - INFN); BOUCENNA, Sofiane (LNF - INFN); KRAUSS, Martin (LNF - INFN)

Presenter(s) : NARDI, Enrico (LNF - INFN)

Track Classification : Astroparticles

Status: SUBMITTED

Track Judgements:

Submitted by **NARDI, Enrico** on **Friday 20 November 2015**

Abstract ID : **219**

Euler-Lagrange equations for the effective actions at high energy QCD and gravity

Content

We review the BFKL approach in QCD based on the gluon reggeization. The Euler-Lagrange equation for the reggeized gluon interactions are derived from the corresponding effective action and independently also from considerations related to the gauge invariance. In N=4 SUSY the BFKL Pomeron is equivavalent to the reggeized graviton. Therefore it is natural to consider an effective action for reggeized gravitons. We construct the Euler-Lagrange equations for this action in the Einstein gravity and discuss their solutions.

Primary author(s) : LIPATOV, Lev (P)

Presenter(s) : LIPATOV, Lev (P)

Track Classification : High-Energy QCD

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **220**

Building a Dissipative Model For Three-Neutrinos propagation

Content

We are building a dissipative approach for three-neutrino propagation in matter. In this approach, the dissipative parameters describe the decoherence and relaxation effects and they are interpreted in different way, but both effects depend on the propagation distance. Thus, stringent bounds on relaxation effects can be obtained from solar neutrinos, but in this case, the decoherence effect is not important since the quantum interference is averaged out. In this work, we show our limits for the relaxation effects from a simple analysis where we combine 8 **B** , 7 **Be** and low-energy solar neutrinos. These limits can be compared with the current limits for the decoherence effect and our result implies that the terrestrial experiments are not sensitive to the relaxation effects, but they are suitable to put bounds on each decoherence parameters.

Primary author(s) : OLIVEIRA, Roberto (Universidade Estadual de Campinas)

Co-author(s) : GUZZO, Marcelo M. (UNICAMP)

Presenter(s) : OLIVEIRA, Roberto (Universidade Estadual de Campinas)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **OLIVEIRA, Roberto** on **Friday 20 November 2015**

Abstract ID : **221**

On the detection of the highest energy particles in the Universe with the Pierre Auger Observatory

Content

The Pierre Auger Observatory is the largest cosmic ray detector ever built. It was designed to detect the highest energy particles in the Universe, and it has been taking data since 2004. Our published results range from the measurement of the flux suppression at the highest energies to limits on 1000-PeV neutrinos, from limits on the flux of EeV neutrons from the Galaxy to the measurement of the proton-proton cross section at 57 TeV center-of-mass energy. In this talk I will describe the Pierre Auger Observatory, present our most recent measurements, discuss their implications on the understanding of the origin of these particles, and remark on the exciting prospects for the near future.

Primary author(s) : MOSTAFA, Miguel (Penn State University)

Presenter(s) : MOSTAFA, Miguel (Penn State University)

Track Classification : Astroparticles

Comments:
This is an invited overview talk.

Status: SUBMITTED

Track Judgements:

Submitted by **MOSTAFA, Miguel** on **Friday 20 November 2015**

Abstract ID : **222**

A Green's function method for calculating the lifetime of the false vacuum in radiatively generated potentials

Content

Within many models of particle physics, we are supposed to find ourselves within a false vacuum state. Most strikingly, this includes the Standard Model with the observed masses of the Higgs boson and the top quark. Requiring that the lifetime exceeds the age of the Universe is therefore an important criterion for the phenomenological viability of these models. The basic method of calculating the lifetime within a tree-level potential was established by Coleman and Callan long ago. However, for scenarios of phenomenological interest, radiative corrections are important, what suggests to use the effective potential. This however is ill-defined in classically non-convex regions. Moreover, it does not capture effects from the kinetic energy of the tunneling soliton. I will discuss why these issues may be of crucial importance and present examples of how these problems are cricumvented by calculating the loop corrections using Green functions obtained within the solitonic background.

Primary author(s) : Dr. GARBRECHT, Bjorn (TUM)

Presenter(s) : Dr. GARBRECHT, Bjorn (TUM)

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Friday 20 November 2015**

Abstract ID : **223**

Hadron Spectroscopy at BESIII

Content

Hadron spectroscopy is a unique way to access QCD, which is one of the most important physics goals of BESIII. BESIII brings great opportunities to study the XYZ states of charmonium by directly producing the Y states up to 4.6 GeV. High statistics of charmonium decays collected at BESIII provide an excellent place for hunting glue balls and studying the excited baryons. Recent results of light hadron spectroscopy and charmonium spectroscopy from BESIII will be reported.

Primary author(s) : MAGGIORA, Marco (Universita e INFN Torino (IT))

Presenter(s) : MAGGIORA, Marco (Universita e INFN Torino (IT))

Track Classification : Hadron Spectroscopy

Comments:

Talk provided on behalf of the BESIII Collaboration; it is not clear to me how to insert "on behalf of the BESIII Collaboration" in the authorship part of this forum.

Status: SUBMITTED

Track Judgements:

Submitted by **MAGGIORA, Marco** on **Saturday 21 November 2015**

Abstract ID : **224**

The Puzzle-Not-About the Proton Size: And It Might Be New Physics

Content

The "proton size puzzle" has been greatly misunderstood and greatly underestimated. It is more than "something about muonic hydrogen" compared to electron-based experiments. We give a comprehensive review of the depth of the puzzle and its likely repercussions. Standard Model theory simply cannot be reconciled with more than one feature of existing data. The data include the electron and muon's anomalous moments, the Rydberg constant, muonic Lamb shifts in hydrogen and deuterium, high-precision values of the electron and proton mass, some parameters wrongly called charge radii, and the venerable fine structure constant. Piecemeal new physics attempting to solve one problem at a time has not worked out. The reach of the problem presents a global challenge where not even the fundamental constants are secure. If the data is wrong, it must be wrong in at least three independent and perfectly correlated ways. Otherwise, the puzzle-not-about the proton size is the outstanding interdisciplinary conundrum of our era. We maintain it will either uncover new physics, or cause a major structural revision of how physics has been conducted for decades.

Primary author(s) : RALSTON, John (University of Kansas)

Co-author(s) : Mr. MARTENS, John (University of Kansas)

Presenter(s) : RALSTON, John (University of Kansas)

Track Classification : Hadron Structure; Beyond SM; Dark Matter searches; Future experiments

Status: SUBMITTED

Track Judgements:

Submitted by **RALSTON, John** on **Saturday 21 November 2015**

Abstract ID : **225**

Forward physics with proton tagging at the LHC

Content

We will first present the constraints on the pompon structure that can be obtained using diffractive measurements at the LHC with proton tagging. We will also describe the prospects on quartic anomalous couplings between photons, W and Z bosons at high luminosity at the LHC using proton tagging.

Primary author(s) : ROYON, Christophe (University of Kansas (US))

Presenter(s) : ROYON, Christophe (University of Kansas (US))

Track Classification : High-Energy QCD; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **ROYON, Christophe** on **Saturday 21 November 2015**

Abstract ID : **226**

Evidence for Exclusive WW production at 8TeV and other forward physics results from CMS

Content

We present the result of the search for exclusive WW production at 8TeV center of mass energy, which provides new limits on anomalous Quartic Gauge couplings, as well as other results from the LHC Run I and early Run II low luminosity results.

Primary author(s) : MORA HERRERA, Clemencia (Universidade do Estado do Rio de Janeiro (BR))

Presenter(s) : MORA HERRERA, Clemencia (Universidade do Estado do Rio de Janeiro (BR))

Track Classification : Non-perturbative QCD; Beyond SM

Comments:
This talk has been proposed to be given on behalf of the CMS collaboration.

Status: SUBMITTED

Track Judgements:

Submitted by **MORA HERRERA, Clemencia** on **Saturday 21 November 2015**

Abstract ID : **227**

Adjoint $SU(5)$ GUT model with T_7 flavor symmetry

Content

We propose an adjoint $SU(5)$ GUT model with a T_7 family symmetry and an extra $Z_2 \otimes Z_2' \otimes Z_3 \otimes Z_4 \otimes Z_{12}$ discrete group, that successfully describes the prevailing Standard Model (SM) fermion mass and mixing pattern. The observed hierarchy of the charged fermion masses and the quark mixing angles arises from the $Z_3 \otimes Z_4 \otimes Z_{12}$ symmetry breaking, which occurs near to the GUT scale. The light active neutrino masses are generated by type I and type III seesaw mechanisms mediated by the fermionic $SU(5)$ singlet and the adjoint **24**-plet. We construct several benchmark scenarios, which lead to $SU(5)$ gauge coupling unification and are compatible with the known phenomenological constraints originating from the lightness of neutrinos, proton decay, dark matter, etc. These scenarios contain TEV scale colored fields, which could give rise to a visible signal or be stringently constrained at the LHC.

Primary author(s) : Dr. CAROLINA, Arbelaez (Universidad Tecnica Federico Santa Maria); Dr. ANTONIO ENRIQUE, Carcamo (Universidad Tecnica Federico Santa Maria); Prof. SERGEY, Kovalenko (Universidad Tecnica Federico Santa Maria); Prof. IVAN, Schmidt (Universidad Tecnica Federico Santa Maria)

Presenter(s) : Dr. CAROLINA, Arbelaez (Universidad Tecnica Federico Santa Maria)

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **ARBELAEZ, Carolina** on **Saturday 21 November 2015**

Abstract ID : **228**

Latest Results from the Q-weak Experiment at Jefferson Lab

Content

The Q-weak collaboration at Jefferson Lab was formed to make the first direct measurement of the weak charge of the proton. Because the Z^0 coupling to the proton is proportional to $1 - 4sin^2(\Theta_W)$ in elastic scattering, the resulting parity violating (PV) asymmetry is suppressed in the Standard Model. A precise measurement is therefore sensitive to new, PV electron-quark interactions at the TeV scale. To control hadronic form factor uncertainties, our momentum transfer was kept far below 1 GeV/c, resulting in a PV asymmetry of roughly only -200 ppb. (To put this small asymmetry in context, it is of scale the thickness of the paint atop the Eiffel Tower.) Since mid-2012 when we finished two years of data taking, we have published a Phys Rev Letter on the weak proton charge based on about 1/25 of the data, completed several analyses of relatively large (several 1000 ppb-level) hadronic asymmetries, graduated over a dozen Ph.D. students, and have kept the remaining students busy strangling some fascinating systematic errors we encountered at the 10 ppb level. Unblinding of the final, full-statistics result will likely take place later in 2016. The status of this enormous effort will be summarized.

Primary author(s) : MACK, David (TJNAF)

Presenter(s) : MACK, David (TJNAF)

Track Classification : Beyond SM

Comments:
David J. Mack, for the Q-weak Collaboration

Status: SUBMITTED

Track Judgements:

Submitted by **MACK, David** on **Saturday 21 November 2015**

Abstract ID : **229**

Lepton mass e[U+FB00]ects in semileptonic B(c,s) meson decays using the WSB, ISGW, ISGW2, HEAVY QUARKS and LCSR models.

Content

In this work the lepton mass effects in semileptonic $B_{(c,s)}$ meson decays using the WSB, ISGW, ISGW2, HEAVY QUARKS (HQ) and LCSR models were studied. We computed branching ratios for $B_{(s,c)} \to D_{(s,c)}\ell\nu_\ell$ decays and calculate the fractions $R = \frac{\mathcal{B}(B\to D\tau\nu_\tau)}{\mathcal{B}(B\to D\ell\nu_\ell)}$ and $R^* = \frac{\mathcal{B}(B\to D^*\tau\nu_\tau)}{\mathcal{B}(B\to D^*\ell\nu_\ell)}$.

Primary author(s) : Mr. HUMBERTO, TriviÑo Navarro (UNIVERSIDAD DEL TOLIMA)

Presenter(s) : Mr. HUMBERTO, TriviÑo Navarro (UNIVERSIDAD DEL TOLIMA)

Track Classification : Higgs Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Saturday 21 November 2015**

Abstract ID : **230**

Status of the Angra Neutrino experiment: detector performance and simulation results.

Content

The Angra Neutrino Experiment will be the first neutrino detector designed, constructed and operated in Brazil. Its purpose is to monitor the Angra-II nuclear reactor, helping to develop neutrino-based safeguard technologies. The Angra II power plant, with its 4GW thermal power, will provide at the detector location, 30 m of the reactor core, a few thousand antineutrino interactions per day. The main challenge of the experiment will be to overcome the very high cosmic ray induced background at sea level. The detector comprises four active volumes, including a central water Cherenkov detector target, with fiducial volume of 1.4 m3 filled with a solution of GdCl3. The whole system was assembled at Centro Nrasileiro de Pesquisas Físicas, CBPF, for cosmic rays tests and will be installed in the Angra power plant in May 2016. The current status of simulations, detector performance, background measurements and other tests will be presented.

Primary author(s) : Dr. DOS ANJOS, Joao (Observatório Nacional)

Presenter(s) : Dr. DOS ANJOS, Joao (Observatório Nacional)

Track Classification : Future experiments

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Saturday 21 November 2015**

Abstract ID : **231**

Gravitational instability on propagation of mhd waves in astrophysical plasma

Content

The study of wave dynamics in a homogeneous plasma is of fundamental interest in solar and astrophysical plasmas. Magnetohydrodynamic (MHD) instabilities play a major role in a great variety of astrophysical and space applications. We determine the general dispersion relation for the propagation of (MHD) waves in astrophysical plasma by considering the effect of gravitational instability and viscosity with anisotropic pressure tensor and heat-conducting plasma. Basic MHD equations have been derived and linearized by the method of perturbation to develop the general form of dispersion relation equation. We discussed the solutions of the dispersion relation in various special cases corresponding to the standard wave mode of stability and instability zero β, low β and high β plasmas. Our result indicates that the transverse propagationnof waves in such a plasma is affected by the inclusion of heat conduction. For wave propagation, parallel to the magnetic field direction, we find that the fairhose mode is unaffected, whereas the mode corresponding to the gravitational instability is modified in astrophysical plasma with anisotropic pressure tensor being stable in the presence of viscosity and strong magnetic field at considerable wavelength

Primary author(s) : Mr. CHERKOS, Alemayehu Mengesha (Kotebe University College)

Presenter(s) : Mr. CHERKOS, Alemayehu Mengesha (Kotebe University College)

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Saturday 21 November 2015**

Abstract ID : **232**

Diffraction at HERA

Content

The cross section of the diffractive process ep -> eXp is measured at a centre-of-mass energy of 318 GeV, where the system X contains at least two jets and the leading final state proton p is detected in the H1 Very Forward Proton Spectrometer. The measurement is performed in photoproduction with photon virtualities Q^2<2 GeV^2 and in deep-inelastic scattering with 4<Q^2<80 GeV^2. The results are compared to NLO QCD calculations based on diffractive parton distribution functions as extracted from measurements of inclusive cross sections in diffractive DIS. A complementary process, ZEUS present measurements of the diffractive production of isolated ("prompt") photons in photoproduction, with and without a jet. Cross sections are evaluated for centrally produced photons with jets as a function of the photon and jet transverse energy and pseudorapidity, and also for the fraction of incoming photon energy imparted to the photon-jet system. Comparison is made to predictions from Rapgap. A measurement is presented dijet cross sections in diffractive deep-inelastic ep scattering at HERA using data collected by the H1 experiment. The investigated phase space is spanned by the photon virtuality in the range of 4<Q2<100 GeV2 and by the fractional proton longitudinal momentum loss x_pom<0.03. The resulting cross sections are compared with NLO QCD predictions based on diffractive PDFs and the value of the strong coupling constant is extracted. The exclusive dijet production in diffractive deep inelastic e+- p scattering has been measured with the ZEUS detector at HERA. The results are compared to predictions from models which are based on different assumptions about the nature of the diffractive exchange.

Primary author(s) : VALKAROVA, Alice (Charles University (CZ))

Presenter(s) : VALKAROVA, Alice (Charles University (CZ))

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Saturday 21 November 2015**

Abstract ID : **233**

ATLAS Upgrades for the next Decades

Content

After the successful operation at the center-of-mass energies of 7 and 8 TeV in 2010 - 2012, the LHC is now running at the center-of-mass energies of 13 TeV. Meanwhile, plans are actively advancing for a series of upgrades of the accelerator, culminating roughly ten years from now in the high-luminosity LHC (HL-LHC) project, delivering of the order of five times the LHC nominal instantaneous luminosity along with luminosity leveling. The ultimate goal is to extend the dataset for ATLAS and CMS from about few hundred fb-1 expected for LHC running in the next 10 years to 3000 fb-1 by around 2035. In parallel, the experiments need to be kept lockstep with the accelerator to accommodate running beyond the nominal luminosity this decade. Along with maintenance and consolidation of the detector in the past few years, ATLAS has added inner b-layer to its tracking system. The challenge of coping with the HL-LHC instantaneous and integrated luminosities, along with the associated radiation levels, requires further major changes to the ATLAS detector. The designs are developing rapidly for a new all-silicon tracker, significant upgrades of the calorimeter and muon systems, as well as improved triggers and data acquisition. ATLAS is also examining potential benefits of extensions to larger pseudorapidity, particularly in tracking and muon systems. This report summarizes various improvements to the ATLAS detector required to cope with the anticipated evolution of the LHC luminosity during this decade and the next.

Primary author(s) : AIELLI, Giulio (Universita e INFN Roma Tor Vergata (IT))

Presenter(s) : AIELLI, Giulio (Universita e INFN Roma Tor Vergata (IT))

Track Classification : Instrumentation and Detectors

Status: SUBMITTED

Track Judgements:

Submitted by **AIELLI, Giulio** on **Sunday 22 November 2015**

Abstract ID : **234**

Neutrino Masses and Deviation from Tri-bimaximal mixing with Inverse Seesaw Mechanism

Content

We propose a model, based on a flavor symmetries and inverse seesaw mechanism, where both the light neutrino masses and the deviation from tri-bimaximal mixing matrix can be linked to the source of lepton number violation. The hierarchies of the charged leptons are explained. We find that the quark masses including their hierarchies and the mixing can also be constructed in a similar way.

Primary author(s) : Dr. ABBAS ABDALGALIL, Mohammed (Zewail City of Science and Technology, Center for Fundamental Physics (CFP))

Presenter(s) : Dr. ABBAS ABDALGALIL, Mohammed (Zewail City of Science and Technology, Center for Fundamental Physics (CFP))

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 23 November 2015**

Abstract ID : **235**

Recent Results and Future Plans for Dark Matter Searches with PICO

Content

The PICO experimental program at SNOLAB uses superheated bubble chambers to search for evidence of dark matter primarily through spin-dependent interactions on 19 F in C3F8. Recoiling nuclei from WIMP-nucleon interactions in the active fluid deposit enough energy locally to initiate a phase transition in the fluid. The bubbles which form are observed with stereo cameras and their acoustic signature is recorded by sensitive pieze-electric transducers. By controlling the degree of superheat, the detector can be made insensitive to gamma and electron backgrounds. Alpha particles with relatively longer tracks have a distinctly different acoustic signal when compared to nuclear recoils which enables this background to be identified and discriminated against. The recent results from the PICO collaboration will be presented, along with an outlook for the future program with this unique technology.

Primary author(s) : Prof. NOBLE, Anthony (Queen's University)

Presenter(s) : Prof. NOBLE, Anthony (Queen's University)

Track Classification : Dark Matter searches

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 23 November 2015**

Abstract ID : **236**

QCD running in neutrinoless double beta decay: Short-range mechanisms

Content

The decay rate of neutrinoless double beta ($0\nu\beta\beta$) decay contains terms from heavy particle exchange, which lead to dimension-9 (d = 9) six fermion operators at low energies. Limits on the coefficients of these operators have been derived previously neglecting the running of the operators between the high-scale, where they are generated, and the energy scale of double beta decay, where they are measured. Here we calculate the leading order QCD corrections to all possible d=9 operators contributing to the $0\nu\beta\beta$ amplitude and use RGE running to calculate 1-loop improved limits. Numerically, QCD running changes limits by factors of the order of or larger than typical uncertainties in nuclear matrix element calculations. For some specific cases, operator mixing in the running changes limits even by up to two orders of magnitude. Our results can be straightforwardly combined with new experimental limits or improved nuclear matrix element calculations to re-derive updated limits on all short-range contributions to $0\nu\beta\beta$ decay.

Primary author(s) : Dr. GONZÁLEZ, Marcela (UTFSM); Prof. HIRSCH, Martin (IFIC/CSIC - University of Valencia); Prof. KOVALENKO, Sergey (UTFSM)

Presenter(s) : Dr. GONZÁLEZ, Marcela (UTFSM)

Track Classification : High-Energy QCD; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **GONZÁLEZ, Marcela** on **Monday 23 November 2015**

Abstract ID : **237**

Hadron Structure and Spectroscopy studies with the COMPASS experiment at CERN

Content

The COMPASS fixed-target experiment at CERN uses the SPS secondary and tertiary beams for hadron structure and spectroscopy studies. In the nucleon structure sector COMPASS has concentrated on Deep-Inelastic Scattering (DIS) and Semi-Inclusive DIS (SIDIS) experiments with a positive polarity muon beam. The data collected with either proton or deuteron polarised targets are mainly used to determine the polarised parton distribution functions (PDF) and Transverse Momentum-dependent Distributions (TMD) and to study the quarks fragmentation functions for pions and kaons. For its hadron spectroscopy programme COMPASS has collected large data samples with either negative or positive hadron beam. The date are used to search for new hadronic states such as exotic mesons and glueballs, and for an evaluation of the pion polarisability. A selection of the COMPASS recent results for both structure and spectroscopy programmes will be shown.
Since 2014 COMPASS is extending its nucleon structure programme to Drell-Yan and Deeply-Virtual Compton Scattering measurements (DVCS). The use of a polarised target will allow measurements of Drell-Yan single-spin asymmetries. A comparison with the single-spin asymmetries already measured in SIDIS will provide a stringent test of the fundamental QCD factorisation assumptions. The motivations for this programme and the anticipated results will be discussed. The planned DVCS measurements give access to the Generalised Parton Distributions (GPD). Positive and negative muons beams scattered off an unpolarised proton target will allow measurements of the experimental beam charge and spin sum and difference. The results will provide a determination of the transverse nucleon size as a function of the parton longitudinal momentum. The status of the experiment, the expected results and the plans for future GPD measurements will be presented.

Primary author(s) : PLATCHKOV, Stephane (CEA/IRFU,Centre d'etude de Saclay Gif–sur-Yvette (FR))

Presenter(s) : PLATCHKOV, Stephane (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR))

Track Classification : Hadron Spectroscopy; Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **PLATCHKOV, Stephane** on **Monday 23 November 2015**

Abstract ID : **238**

Reggeon Field Theory as an effective field theory for high energy scattering

Content

In an attempt of investigating the small-x limit in QCD in the nonpertubative region we study the flow equations of reggeon field theory in the infrared/high energy limit. We find a candidate for a fixed point and investigate its properties and possible physical consequences.

Primary author(s) : Dr. BARTELS, Joachim (University Hamburg)

Track Classification : Non-perturbative QCD

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Tuesday 24 November 2015**

Abstract ID : **239**

Probing QGP at RHIC with leptonic and quarkonia probes.

Content

Since the onset of high energy heavy ion physics the leptons (real and virtual photons) and quarkonia were considered as the best penetrating probes for the structure of the dense and hot quark-gluon medium, created in the collision. The collectivity visible in thermal photon and dilepton emission studied at RHIC was found consistent with emission from a hot state with properties controlled by its temperature and initial thermalization time [U+F074]0 as prescribed by QGP theory. The development of the free color charges in thermalization phase leads to the screening of chromo-electric fields and affects the abundances of the heavy quark final bound states. Survival of charmonium (and heavier) states becomes a QGP chronometer and thermometer which, unfortunately, is distorted by bound state interaction with the medium – collision losses of heavy quarks and suppression, as well as suppression ordering, of heavy quarkonia become intertwined and cannot be separated without detailed studies of heavy quark production rates in the whole range of energies currently available at RHIC and LHC. PHENIX at RHIC carried out a successful program of measuring both the lepton and quarkonia production in collisions of different nuclei using the same apparatus and similar signal extraction technology. It produced a wealth of critical data including complementary measurements of yields of thermal and hard photons at the mid rapidity, as well as quarkonia production at mid and forward rapidities. In this talk I will discuss the highlights of these results and the ongoing RHIC upgrades towards enhancing sensitivity of its physics program to different sources of photons and dileptons in hot stages of the collision.

Primary author(s) : KISTENEV, Edouard (Department of Physics)

Presenter(s) : KISTENEV, Edouard (Department of Physics)

Track Classification : High-Energy QCD; Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Tuesday 24 November 2015**

Abstract ID : **240**

Searches for Extra Higgs Doublets in the ZZh Final State

Content

We analyze the reach for searches for extra Higgs doublets of the two Higgs doublet model in the ZZh final state, considering the $lljjbb$, $llllbb$, $llll + \not{E}_T$, $ll\gamma\gamma\nu\bar{\nu}$ and $ll\gamma\gamma jj$ final states. We show that this can be the most sensitive probe of new physics in a Type I 2HDM at large $\tan\beta$.

Primary author(s) : GAO, Christina (University of California Davis); LUTY, Markus (University of California Davis); MULHEARN, Michael (University of California Davis); NEILL, Nicolas (University of California Davis); WANG, Zhangqier (University of California Davis)

Presenter(s) : NEILL, Nicolas (University of California Davis)

Track Classification : Higgs Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **NEILL, Nicolas** on **Wednesday 25 November 2015**

Abstract ID : **241**

Disentangling Shadowing from Coherent Energy Loss using the Drell-Yan Process

Content

We suggest the measurement of Drell-Yan (DY) lepton pairs in p–Pb collisions at the LHC ($\sqrt{s} = 5.02$ TeV) in order to disentangle the relative contributions of shadowing and coherent energy loss in quarkonium production off nuclei. The nuclear modification of low mass DY production is computed at NLO using various sets of nuclear parton densities. It is then observed that shadowing effects strongly cancel out in the J/ψ over DY suppression ratio R_J/ψ (y)/R_DY (y), unlike the effect of coherent energy loss. Such a measurement could be performed at forward rapidity by the ALICE and LHCb collaborations at the LHC.

Primary author(s) : ARLEO, Francois (Laboratoire Leprince-Ringuet)

Co-author(s) : PEIGNE, Stephane

Presenter(s) : ARLEO, Francois (Laboratoire Leprince-Ringuet)

Track Classification : High-Energy QCD; Heavy Ion collisions

Comments:
This talk coud be part of either High-Energy QCD or Heavy Ion collisions.

Status: SUBMITTED

Track Judgements:

Submitted by **ARLEO, Francois** on **Wednesday 25 November 2015**

Abstract ID : **242**

The Partonic Structure of Nucleons at in the Valence Regime

Content

The valence region is exceedingly important in hadron physics since this region not only defines a hadron but is also an excellent discriminator of nucleon structure models. Present uncertainties in light quark distribution functions at high x could also impact high energy physics. A new generation of experiments at Jefferson Lab is aimed at the high x valence region of the nucleon. Highlights of this program, along with recent Jefferson Lab results, will be presented. Complementary global fitting efforts aimed at reducing uncertainties in parton distribution functions in the valence regime will also be discussed.

Primary author(s) : KEPPEL, Cynthia (Jefferson Lab)

Presenter(s) : KEPPEL, Cynthia (Jefferson Lab)

Track Classification : Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **KEPPEL, Cynthia** on **Wednesday 25 November 2015**

Abstract ID : **243**

Pentaquarks, doubly heavy exotic mesons and baryons and how to look for them

Content

I discuss the experimental evidence for and theoretical interpretation of the new mesons and baryons with two heavy quarks. These include doubly-heavy baryons, exotic hadronic quarkonia and most recently a manifestly exotic pentaquark-like doubly heavy baryon with a minimal quark content $uud\bar{c}$ discovered by LHCb, whose mass, decay mode and width are in agreement with a prediction based on a physical picture of a deuteron-like $\Sigma_c\bar{D}^*$ "hadronic molecule".

Primary author(s) : KARLINER, Marek (Tel Aviv University (IL))

Presenter(s) : KARLINER, Marek (Tel Aviv University (IL))

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Thursday 26 November 2015**

Abstract ID : **246**

Dark Matter searches at CMS

Content

The search for dark matter is currently one of the main goals of the whole particle physics community. The existence of dark matter, indicated by astronomical observations, is one of the main proofs of physics beyond the standard model. Despite its abundance, dark matter has not been directly observed yet. This talk presents several searches for dark matter production in proton-proton collisions at 7 and 8 TeV at the LHC, performed by the CMS collaboration. The main experimental features and results of these searches are described and compared with results from direct- and indirect-detection experiments. Projections and outlooks of the dark matter searches with the LHC Run-2 data are also presented.

Primary author(s) : TROCINO, Daniele (Northeastern University (US))

Presenter(s) : TROCINO, Daniele (Northeastern University (US))

Track Classification : Dark Matter searches

Status: SUBMITTED

Track Judgements:

Submitted by **CARTIGLIA, Nicolo** on **Thursday 26 November 2015**

Abstract ID : **247**

Searches for SUSY with photons in the final state in CMS

Content

We present results of searches for SUSY production at CMS in events with one or two isolated photons, possibly coming from a Higgs decay, using up to 20/fb of data from the 8 TeV LHC run of 2012. The results are interpreted in the context of several SUSY models, including particular gauge-mediation models, with the gravitino as the lightest supersymmetric particle.

Primary author(s) : PENA HERRERA, Cristian Ignacio (California Institute of Technology (US))

Presenter(s) : PENA HERRERA, Cristian Ignacio (California Institute of Technology (US))

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **CARTIGLIA, Nicolo** on **Thursday 26 November 2015**

Abstract ID : **248**

Measurements of Multi-Boson Final States at CMS

Content

Precision measurements of multi-boson production is a validation of the Standard Model in a region where higher order Electroweak and QCD corrections can be taken into account. These multi-boson processes are a background to Higgs measurements and searches for Beyond the Standard Model physics. In addition, multi-boson final states are a probe of quartic gauge couplings. These coupling strengths are directly related to the broken electroweak symmetry and deviations from the SM are a clear signal of new physics. This talk presents recent Run1 and Run2 CMS measurements of the multi-boson final states and their limits on anomalous Quartic Gauge couplings. As the integrated luminosity continues to increase during Run 2, these processes will be measured with greater sensitivity and the limits on anomalous gauge couplings will be tightened.

Primary author(s) : CMS, Speaker (CMS)

Presenter(s) : CMS, Speaker (CMS)

Track Classification : Higgs Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **CARTIGLIA, Nicolo** on **Thursday 26 November 2015**

Abstract ID : **249**

Measurement of the charged-pion polarizability at CERN COMPASS

Content

Pion polarizabilities are of fundamental interest in the low-energy sector of QCD. They are directly linked to the quark-gluon substructure and dynamics of the pion, the lightest bound system of the strong interaction.The electric $\alpha\ \pi$ and magnetic $\beta\ \pi$ charged pion polarizabilities characterize the induced dipole moments (stiffness) of the pion during $\gamma\pi$ scattering. They provide stringent tests of various theoretical models, for example chiral perturbation theory (ChPT). CERN COMPASS investigated pion Compton scattering $\gamma\pi \rightarrow \gamma\pi$, via radiative pion Primakoff scattering (Bremsstrahlung of 190 GeV/c negative pions) in the nuclear Coulomb field of the Ni nucleus: π + Ni $\rightarrow \pi + \gamma$ + Ni. Previously, a low statistics Primakoff scattering experiment was carried out in the 1980's in Serpukhov (Russia). Such Primakoff data are equivalent to $\gamma\pi$ Compton scattering for laboratory γ's having momenta of order 1 GeV/c incident on a target pion at rest. Later, other polarizability results based on gamma-proton and gamma- gamma collisions were also reported. The COMPASS measurement demonstrates that the charged-pion polarizability is significantly smaller than the previous results, roughly by a factor two, with the smallest uncertainties realized so far. The COMPASS data yield polarizability values $\alpha\ \pi = -\beta\ \pi = (2.0 \pm 0.6$ stat ± 0.7 syst $) \times 10\ -4$ fm 3 , in agreement with ChPT. The COMPASS Collaboration, C. Adolph et al. (2015). Measurement of the Charged- Pion Polarizability. Physical Review Letters, 114(6), 062002.

Primary author(s) : MOINESTER, Murray (Tel Aviv University)

Presenter(s) : MOINESTER, Murray (Tel Aviv University)

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Monday 30 November 2015**

Abstract ID : **250**

The Proton Radius Puzzle

Content

The extremely precise extraction of the proton radius obtained by Pohl et al and Antognini et al from the measured energy difference between the 2P and 2S states of muonic hydrogen disagrees significantly with that obtained from electronic hydrogen or elastic-electron proton scattering. This discrepancy is known as the proton radius puzzle. The talk explains the origins of this puzzle and the reasons for believing it to be important. In particular, the muon-proton interaction may differ from the electron-proton interaction in unexpected ways. Various possible solutions of the puzzle are identified and the future research needed for resolution is discussed.

Primary author(s) : Prof. MILLER, Gerald (University of Washington)

Presenter(s) : Prof. MILLER, Gerald (University of Washington)

Track Classification : Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 30 November 2015**

Abstract ID : **251**

Majorana neutrino masses - A story of trees and loops

Content

Majorana neutrino masses can be generated as dimension-5 operator, the well-known Weinberg operator, or at higher order: d=7, d=9 etc. They could be generated either at tree-level, the famous seesaw mechanism(s), or radiatively at 1-loop, 2-loop etc order. This talk gives an overview on the various possible Majorana neutrino mass models and discusses classification schemes for radiative models. While the classical tree-level type-I seesaw will probably never be tested in the laboratory, many model variants exist which can give rise to interesting signals at the LHC and in low-energy lepton flavour violation experiments.

Primary author(s) : HIRSCH, Martin (IFIC/CSIC, University of Valencia)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 30 November 2015**

Abstract ID : **252**

Hadronization and cold matter effects at medium energies

Content

We present a model for pions production in DIS on nuclei at medium energies.
These kinds of experiments are ideal for the study of the space-time development of hadronization.
In [1], a similar model has been used successfully for the description of HERMES data. Here, we present
an improved version of this model, where the hadronization part is based on Berger's model [2]. Comparisons
will be done with the CLAS experiment which has much higher statistics than HERMES.
[1] B.Z. Kopeliovich, J. Nemchick, E. Predazzi and A. Hayashigaki; Nucl. Phys. A 740 (2004).
[2] E.L. Berger, Phys. Lett. B 89 (1980) 241

Primary author(s) : Dr. GUIOT, Benjamin (UTFSM)

Presenter(s) : Dr. GUIOT, Benjamin (UTFSM)

Track Classification : Hadron Spectroscopy

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 30 November 2015**

Abstract ID : **253**

Toward a purely affine theory of gravity

Content

General Relativity has proven to be a successful theory of gravity, and thus the relation between gravitation and geometry has settled in the scientific community. Although the curvature can be built solely with a connection, in gravitational context it is customary to restrict the connection to be a potential field for the spacetime metric. In this work we present our "grain of sand" toward a generalization of gravity built up with an affine connection. Among the kind features of this proposal we encounter: 1) Its action is a polynomial of the connection and its derivatives, 2) The lowest geodesic perturbation leads to a Newtonian gravitational potential, 3) Presents a well-behaved limit of vanishing torsion, and in this limit the field equations for the connection admits Einstein manifolds as solutions.

Primary author(s) : CASTILLO-FELISOLA, Oscar (Universidad Tecnica Federico Santa Maria)

Presenter(s) : CASTILLO-FELISOLA, Oscar (Universidad Tecnica Federico Santa Maria)

Track Classification : Astroparticles

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 02 December 2015**

Abstract ID : **255**

Interplay of the LHC and Dark Matter search experiments in unravelling Natural Supersymmetry

Content

We have explored Natural Supersymmetry (NSUSY) scenarios with low values of the mu-parameter which are characterised by higgsino-like Dark Matter (DM) and compressed spectra for the lightest MSSM particles. This scenario could be probed via monojet signatures, but as the signal-to-background ratio (S/B) is low we demonstrate that the 8 TeV LHC cannot obtain limits on the DM mass beyond those of LEP2. On the other hand, we have found, for the 13 TeV run of the LHC, that by optimising kinematical cuts we can bring the S/B ratio up to the 5(3)% level which would allow the exclusion of the DM mass up to 200(250) GeV respectively, significantly extending LEP2 limits. Moreover, we have found that LUX/XENON1T and LHC do play very complementary roles in exploring the parameter space of NSUSY, as the LHC has the capability to access regions where DM is quasi-degenerate with other higgsinos, which are challenging for direct detection experiments.

Primary author(s) : BELYAEV, Alexander (STFC - Rutherford Appleton Lab. (GB))

Presenter(s) : BELYAEV, Alexander (STFC - Rutherford Appleton Lab. (GB))

Track Classification : Dark Matter searches

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 02 December 2015**

Abstract ID : **256**

The Dark Energy Survey: an overview and recent results

Content

In this talk I will give an overview of the ongoing Dark Energy Survey and highlight some of the recent results.

Primary author(s) : ROSENFELD, Rogerio (Instituto de Física Teórica - UNESP & ICTP–SAIFR & LIneA)

Presenter(s) : ROSENFELD, Rogerio (Instituto de Física Teórica - UNESP & ICTP-SAIFR & LIneA)

Track Classification : Dark Matter searches

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 02 December 2015**

Abstract ID : **257**

The Deep Underground Neutrino Experiment - DUNE: the precision era of neutrino physics

Content

The last decade was remarkable for neutrino physics. In particular, the phenomenon of neutrino flavor oscillations has been firmly established by a series of independent measurements using solar, atmospheric, reactor and accelerator neutrino beams. All parameters of the neutrino mixing matrix are now known, and we have the elements to plan a judicious exploration of new scenarios that are opened by these recent advances. It is time to go further with precise measurements to test the 3-neutrino paradigm and important questions like the neutrino mass hierarchy and CP asymmetry in the lepton sector. Within this context the future long-baseline experiments are considered to be a fundamental tool to deepen our knowledge of electroweak interactions. The Deep Underground Neutrino Experiment – DUNE will detect a broad-band neutrino beam from Fermilab in an underground massive Liquid Argon Time-Projection Chamber at an L/E of about 10^3 km / GeV to reach good sensitivity for CP-phase measurements and the determination of the mass hierarchy. The dimensions and the depth of the Far Detector also create an excellent opportunity to look for rare signals like proton decay to study violation of baryonic number, as well as supernova neutrino bursts, broadening the scope of the experiment to astrophysics and associated impacts in cosmology. In this presentation, we will discuss the physics motivations and the main experimental features of the DUNE project required to reach its scientific goals.

Primary author(s) : KEMP, Ernesto (University of Campinas)

Presenter(s) : KEMP, Ernesto (University of Campinas)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 02 December 2015**

Abstract ID : **258**

Magnetized effective QCD phase transition

Content

The QCD phase diagra in the temperature vs. quark chemical potential plane is studied in the presence of a magnetic field, using the linear sigma model coupled to quarks. We show that the decrease of the couplings with increasing field strength obtained in this model leads to the critical temperature for the phase transition to decrease with increasing field intensity (inverse magnetic catalysis), This happens provided the plasma screening is properly accounted for. It is also shown that with increasing field strength the location of the critical end point in the phase diagrama moves toward lower values of the critical quark chemical potential and larger values of the critical temperature.In fact, the critical end point approaches the temperature axis for large values of the magnetic field. We argue that a similar behavior is to be expected in QCD, since the physical impact of the magnetic field, regardless of strength, is to produce a spatial dimension reduction, whereby virtual quark-antiquark pairs are closer on average and thus the the strength of the interactions decreases due to asymptotic freedom.

Primary author(s) : Prof. LOEWE, Marcelo (Pontificia Universidad Catolica de Chile and CCVAL)

Presenter(s) : Prof. LOEWE, Marcelo (Pontificia Universidad Catolica de Chile and CCVAL)

Track Classification : Phenomenology of AdS/CFT

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 02 December 2015**

Abstract ID : **259**

Recent results from the PHENIX experiment

Content

In the past several years, the RHIC collider has provided a wealth of collisions of various nuclear species at a range of collision energies, allowing for a systematic study of the conditions suitable for the creation of a Quark-Gluon Plasma. The PHENIX experiment has exploited this versatility, constraining those conditions and the respective QGP properties with a variety of observables. In this talk, we will report on recent results with a focus on the formation of a QGP in small collision systems, and measurements of direct photons, dileptons, and heavy quarks, which are the strengths of the experiment.

Primary author(s) : BATHE, Stefan (Baruch College, CUNY)

Presenter(s) : BATHE, Stefan (Baruch College, CUNY)

Track Classification : Heavy Ion collisions

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Thursday 03 December 2015**

Abstract ID : **260**

Double parton scattering at high energy proton collisions

Content

In this work we study, for the first time, the production of prompt photons in Double Parton Scattering (DPS) processes at the LHC. In a DPS process one can have, from one proton-proton collision, two interacting partons coming from each colliding hadron. We also study the relation between the double parton distribution functions (dPDF) and the usual parton distributions (PDF), leading to the formula for the DPS cross section. We calculate the rapidity and tranverse momentum distributions for the production of two, three and four photons at the $\sqrt{s} = 14\,\text{TeV}$ LHC energy.

Primary author(s) : Mr. PALOTA DA SILVA, Rafael (Universidade Federal do Rio Grande)

Presenter(s) : Mr. PALOTA DA SILVA, Rafael (Universidade Federal do Rio Grande)

Track Classification : High-Energy QCD

Comments:
poster presentation

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Friday 04 December 2015**

Abstract ID : **261**

Interpreting a possible 2 TeV resonance at the LHC

Content

A diboson excess has been observed —albeit with very limited statistical significance— in WW, WZ and ZZ final states at the LHC experiments using the accumulated 8 TeV data. Assuming that these signals are due to resonances resulting from an extended symmetry breaking sector in the standard model and exact custodial symmetry we determine using unitarization methods the values of the relevant low-energy constants in the corresponding effective Lagrangian. Unitarity arguments also predict the widths of these resonances. We introduce unitarized form factors to allow for a proper treatment of the resonances in Monte Carlo generators and a more precise comparison with experiment.

Primary author(s) : ESPRIU CLIMENT, Domenec (University of Barcelona (ES))

Presenter(s) : ESPRIU CLIMENT, Domenec (University of Barcelona (ES))

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 07 December 2015**

Abstract ID : **262**

S3 as a Flavour Symmetry

Content

We present a brief overview of some S3 extensions of the Standard Model, in which the concept of flavour is extended to the Higgs sector by introducing in the theory three Higgs fields which are SU(2) doublets. In both the quark and lepton sectors the mass matrices are reparametrized in terms of their eigenvalues, thus allowing to express the mixing angles in terms of mass ratios. The phenomenological aspects of such models is discussed.

Primary author(s) : MONDRAGON, Myriam (Unknown)

Presenter(s) : MONDRAGON, Myriam (Unknown)

Track Classification : Higgs Physics; Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 07 December 2015**

Abstract ID : **264**

Partonic Transverse Momentum Distributions (TMDs): status and perspectives

Content

A review of the present knowledge of partonic Transverse Momentum Distributions (TMDs) will be presented. In the last years, continuous progress has been made in the knowledge of TMDs, both unpolarized and polarized. However, we are still far from a precise determination of these quantities. Central issues are currently related to the implementation of TMD evolution in the extractions. Future perspectives involve also the study of TMDs in new experiments.

Primary author(s) : BACCHETTA, Alessandro (University of Pavia)

Presenter(s) : BACCHETTA, Alessandro (University of Pavia)

Track Classification : Hadron Structure

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Monday 07 December 2015**

Abstract ID : **265**

Recent results from the Double Chooz experiment for the neutrino mixing angle Theta13

Content

Double Chooz is a reactor neutrino experiment to measure the neutrino mixing angle ϑ13. Two antineutrino detectors at different distances from the reactor cores at the Chooz nuclear power plant are used to measure a deficit in the antineutrino flux and thus determine Theta13. We will present the latest results from an improved analysis of Hydrogen capture events. This is used together with the latest analysis of Gadolinium capture events in a Reactor Rate Modulation study to obtain new results for the mixing angle ϑ13 .

Primary author(s) : DOS ANJOS, Joao (Observatório Nacional)

Presenter(s) : DOS ANJOS, Joao (Observatório Nacional)

Track Classification : Neutrino Physics

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Wednesday 09 December 2015**

Abstract ID : **298**

Searches for low-mass new-physics states with the BABAR detector

Content

We present results from the BaBar experiment on searches for low-mass new physics. This includes a search for a light CP-odd Higgs boson (A0) in Upsilon(1S) -> gamma A0, A0 -> ccbar decays. providing limits on the product branching fraction B(Upsilon(1S) -> gamma A0)xB(A0 -> ccbar) at the level of 7x10-5 - 2x10-3 for A0 masses between 4.0 GeV and 9.25 GeV; and a search for neutral, long-lived particles produced in e+e- collisions or neutral B meson decays obtaining limits on the product of the production cross-section, branching fraction, and reconstruction efficiency for each final state.

Primary author(s) : SOFFER, Abi (Tel Aviv University (IL))

Presenter(s) : SOFFER, Abi (Tel Aviv University (IL))

Track Classification : Beyond SM

Status: SUBMITTED

Track Judgements:

Submitted by **EL ALAOUI, Ahmed** on **Sunday 13 December 2015**

Abstract ID : **299**

Axions in gravity with torsion

Content

We study a scenario allowing a solution of the strong charge parity problem via the Peccei-Quinn mechanism, implemented in gravity with torsion. In this framework there appears a torsion-related pseudoscalar field known as the Kalb-Ramond axion. We compare it with the so-called Barbero-Immirzi axion recently proposed in the literature also in the context of the gravity with torsion. We show that they are equivalent from the viewpoint of the effective theory. The phenomenology of these torsion-descended axions is completely determined by the Planck scale without any additional model parameters. These axions are very light and very weakly interacting with ordinary matter. We briefly comment on their astrophysical and cosmological implications in view of the recent BICEP2 and Planck data.

Primary author(s) : CORRAL, Cristobal (UTFSM)

Presenter(s) : CORRAL, Cristobal (UTFSM)

Status: SUBMITTED

Submitted by **EL ALAOUI, Ahmed** on **Sunday 20 December 2015**