

# **Diffraction 2012**

## **Contributions book**

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Contribution ID : 1

# Energy evolution of the large-t elastic scattering and correlation with multiparticle production

Friday 14 Sep 2012 at 12:10 (00h20')

## Summary :

We discuss functional dependencies of the large-t elastic scattering and those energy evolution up to the LHC energies. Recent experimental data of the TOTEM experiment and their role in the discrimination of the possible scattering mechanisms are considered. Vanishing the helicity-flip amplitudes would result in the appearance of the oscillations at the large-t differential cross-section. This oscillating behavior would provide evidence for the s-channel helicity conservation in pp-collisions.

**Primary authors** : Dr. TROSHIN, Sergey (IHEP, Protvino, Russia)

**Co-authors** : Prof. TYURIN, Nikolay (IHEP, Protvino, Russia)

**Presenter** : Dr. TROSHIN, Sergey (IHEP, Protvino, Russia)

**Session classification** : Diffraction in Hadron-Hadron Collisions (III)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 2

# BFKL Evolution as a Communicator Between Small and Large energy Scales

Thursday 13 Sep 2012 at 09:10 (00h20')

**Summary :**

We show that the eigenfunctions of the BFKL kernel with running coupling are sensitive to the presence of new physics at very high energies and that this in turn affects the behaviour of the BFKL amplitude at energies way below the threshold for such new physics.

**Primary authors :** Prof. ROSS, Douglas (Southampton University)

**Co-authors :** Dr. KOWALSKI, Henri (DESY) ; Prof. LIPATOV, Lev (Petersburg Nuclear Physics Institute)

**Presenter :** Prof. ROSS, Douglas (Southampton University)

**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 4

# Diffraction at the LHC: anomalous couplings and diffractive Higgs

Friday 14 Sep 2012 at 19:35 (00h20')

**Summary :**

After giving the QCD topics which can be studied at the LHC using proton tagging, we will describe the main topics concerning diffraction at high luminosity, namely diffractive Higgs production and its uncertainty and well as the search for anomalous couplings between photons and W/Z bosons.

**Primary authors :** Dr. ROYON, Christophe (IRFU-SPP, CEA Saclay)

**Co-authors :**

**Presenter :** Dr. ROYON, Christophe (IRFU-SPP, CEA Saclay)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 5

# Jet gap jet at the LHC

Friday 14 Sep 2012 at 08:30 (00h20')

**Summary :**

We use the BFKL NLL framework to compute jet gap jet cross section at the Tevatron and the LHC and compare our prediction with the existing data.

**Primary authors :** Dr. ROYON, Christophe Royon (IRFU-SPP, CEA Saclay)

**Co-authors :**

**Presenter :** Dr. ROYON, Christophe Royon (IRFU-SPP, CEA Saclay)

**Session classification :** Diffraction in Hadron-Hadron Collisions (II)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session



Contribution ID : 6

# New results on central exclusive production at hadron colliders

Tuesday 11 Sep 2012 at 10:00 (00h20')

## Summary :

Central exclusive production (CEP) processes in high-energy hadron collisions provide an especially clean environment in which to study the nature and quantum numbers of the new resonance states.

In this talk we discuss selected topics on the CEP, from the so-called diffractive Higgs to heavy resonance production within the formalism developed by the Durham group. We present the new results on the CEP of heavy quarkonia, diphotons and dimesons. We compare the theoretical expectations with the existing experimental results from the Tevatron and the LHC and present further predictions for the CEP processes at the RHIC and LHC colliders.

**Primary authors :** KHOZE, Valery (IPPP, University of Durham, UK)

**Co-authors :**

**Presenter :** KHOZE, Valery (IPPP, University of Durham, UK)

**Session classification :** LHC and Post-LHC (I)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 7

# Where does the spin of the proton come from?

Wednesday 12 Sep 2012 at 09:10 (00h25')

**Summary :**

The progress of lattice calculations toward the study of the quark and glue momenta and angular momenta is reviewed. I will show a complete calculation which includes quark contributions in both the connected and disconnected insertions as well as the contribution from the glue.

**Primary authors :** Prof. LIU, Keh-Fei (University of Kentucky)

**Co-authors :**

**Presenter :** Prof. LIU, Keh-Fei (University of Kentucky)

**Session classification :** Spin Physics (I)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 8

# NLO BFKL kernel for the adjoint representation of the gauge group

Thursday 13 Sep 2012 at 08:50 (00h20')

## Summary :

It is shown that in the next-to-leading order the BFKL kernel for the adjoint representation of the gauge group with subtracted gluon trajectory does not contain infrared divergencies. An explicit form of this kernel in physical transverse momentum space is presented and its conformal properties are discussed. Conformal invariance of the kernel in the N=4 supersymmetric Yang-Mills model permits to calculate its eigenvalues and to obtain the high energy behavior of the remainder function for the 6-point scattering amplitude with the maximal helicity violation in the kinematical regions containing the Mandelstam cut contribution.

**Primary authors :** Prof. FADIN, Victor (Budker Institute of Nuclear Physics)

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**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 9

# GPDs at an Electron Ion Collider

Tuesday 11 Sep 2012 at 18:50 (00h20')

**Summary :**

The feasibility for a precise determination of the Generalized Parton Distribution (GPDs) functions at an Electron Ion Collider (EIC) has been explored. The high luminosity of the machine, together with the large resolution and rapidity acceptance of a newly designed dedicated detector, will open a opportunity for very high precision measurements of GPDs. We report on the access of GPDs from deeply virtual Compton scattering (DVCS) and Vector Meson Production (VMP) measurements. We also point out that such measurements at a proposed EIC provide provide insight to both the transverse distribution of sea quarks and gluons as well as the proton spin decomposition.

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**Session classification :** Diffraction in e-p Collisions (III)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 10

# Reggeometry of lepton- and hadron-induced exclusive diffractive processes

Tuesday 11 Sep 2012 at 19:10 (00h20')

## Summary :

A unified approach to exclusive diffractive lepton- and hadron- induced processes based on a unique pomeron containing two terms, a "soft" and a "hard" one, is suggested. The relative weight of the two terms is controlled by relevant  $\tilde{Q}^2=Q^2+M_V^2$ -dependent factors, where  $Q^2$  is the virtuality of the external photon (or proton,  $Q_p^2=m_p^2$ ) and  $M$  is the mass of the produced vector meson. The  $t$  dependence of the residue is controlled by the slopes (inverse radii) of the colliding particles, thus jus

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**Presenter** : Prof. JENKOVSKY, Laszlo (Bogolyubov Institute for Theoretical Physics, National Academy of Sciences of Ukraine)

**Session classification** : Diffraction in e-p Collisions (III)

**Track classification** : Diffraction in DIS (phenomenology/theory)

**Type** : Talk at plenary session

Contribution ID : 11

# Fitting DIS data at low values of Bjorken $x$

Tuesday 11 Sep 2012 at 16:30 (00h20')

## Summary :

The proton structure function  $F_2$  is analyzed in the low  $x$  regime using BFKL evolution. We present an analytic study at next to leading logarithmic (NLL) accuracy.

Higher order corrections are taken into account through an all-orders resummation introduced to improve the collinear behavior of the NLL BFKL result. We emphasize the importance of the running coupling effects and use a model for the coupling that freezes in the infrared and is consistent with power corrections to jet observables.

A comparison to the latest HERA data for both  $F_2$  and the dependence of the pomeron intercept on  $x$  is presented.

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**Co-authors :**

**Presenter :** Ms. SALAS, Clara (IFT Madrid)

**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 12

# Diffractive neutrino interactions

Tuesday 11 Sep 2012 at 17:10 (00h20')

**Summary :**

Diffractive neutrino-production of pions at low virtuality  $Q^2$  is dominated by the axial current, which is partially conserved. PCAC in the form of the Adler relation connects diffractive diagonal and off-diagonal transitions in the axial channel. This is why high-energy neutrino interactions are usually considered as a sensitive test of the PCAC hypothesis. Final state interactions, known as absorption corrections, lead to a dramatic breakdown of the Adler relation.

**Primary authors :** Prof. KOPELIOVICH, Boris (UTFSM)

**Co-authors :**

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**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 13

# Azimuthal asymmetry of forward neutrons in polarized pp collisions

Wednesday 12 Sep 2012 at 11:40 (00h20')

## Summary :

Recent data on the single-spin asymmetry of leading neutrons from the PHENIX experiment cannot be explained by the pion pole, even corrected for the strong absorption effects. We found a large spin effects from interference of the pion pole with the rho-pion Regge cut, whose parameters are fixed using data on diffractive 3-pion production, and the current algebra relations.

The numerical results of the parameter-free calculation of  $A_N$  are in excellent agreement with the PHENIX data.

**Primary authors :** Prof. KOPELIOVICH, Boris (UTFSM)

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**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session



Contribution ID : 14

# Evolution and definition of TMD's

Wednesday 12 Sep 2012 at 12:00 (00h15')

**Summary :**

Recently we have come out with a definition of TMD's which formally solves many of the formal problems of Collins' one. In this talk I will discuss the evolution and definition of the TMD's, providing results which are as much as possible model independent at NNLL.

**Primary authors :** Dr. SCIMEMI, Ignazio (Universidad Complutense de Madrid)

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**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 15

# Deeply Virtual Compton Scattering from Gauge/Gravity Duality

Tuesday 11 Sep 2012 at 19:50 (00h20')

## Summary :

We use gauge/gravity duality to study deeply virtual Compton scattering (DVCS) in the low  $x$  limit, where the process is dominated by the exchange of the pomeron. At strong coupling, the pomeron is described as the graviton Regge trajectory in AdS space, with a hard wall to mimic confinement effects. This model agrees with HERA data in a large kinematical range. The behavior of the DVCS cross section for very high energies, inside saturation, can be explained by a simple AdS black disk model. In a restricted kinematical window, this model agrees with HERA data as well.

**Primary authors :** Dr. DJURIC, Marko (University of Porto) ; Prof. COSTA, Miguel (University of Porto)

**Co-authors :**

**Presenter :** Dr. DJURIC, Marko (University of Porto)

**Session classification :** Diffraction in e-p Collisions (III)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 16

# Transversity: theory and phenomenology

Wednesday 12 Sep 2012 at 10:00 (00h25')

## **Summary :**

Transversity distribution encodes a basic piece of information on the internal structure of nucleons, sharing the same status with the more familiar unpolarized and helicity distributions. On the other hand its chiral-odd nature makes it much harder to measure. In this talk I will review its properties and discuss different ways to access it, with their highlights and limitations. Recent phenomenological extractions and perspectives are also presented.

**Primary authors :** Dr. D'ALESIO, Umberto (CA)

**Co-authors :**

**Presenter :** Dr. D'ALESIO, Umberto (CA)

**Session classification :** Spin Physics (I)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 17

# Single spin asymmetries in inclusive DIS and in hadronic collisions

Wednesday 12 Sep 2012 at 10:25 (00h20')

## Summary :

Transverse single spin asymmetries (SSAs) in inclusive DIS can be generated through two-photon exchange. We mostly focus on the case where two photons couple to different quarks. Such a contribution involves a quark-photon-quark correlator in the nucleon, which has a relation to the ETQS quark-gluon-quark correlator  $T_F$ , where  $T_F$  plays a key role in the description of transverse SSAs in hadronic collisions. Using different parameterizations for  $T_F$  we compute the transverse target SSA in DIS for both a proton and a neutron target and compare the results to recent data. In particular, we also discuss the implications on our understanding of SSAs in hadronic collisions.

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**Presenter :** METZ, Andreas (Temple University, Philadelphia)

**Session classification :** Spin Physics (I)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 18

# Regge trajectories in QCD

Thursday 13 Sep 2012 at 08:30 (00h20')

**Summary :**

For soft nonsinglet binary processes in diffractive region  $t \ll S$  we show that summing the contributions of the lowest twist operators and all logarithms in QCD leads to a Regge-like amplitude and a fixed singularity in  $j$ -plane. The situation in singlet channel is also discussed.

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**Presenter :** Prof. EFREMOV, ANATOLII (JINR, Dubna)

**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 19

# Color Transparency in Incoherent Electroproduction of $\rho$ Mesons off Nuclei.

Tuesday 11 Sep 2012 at 17:50 (00h20')

## Summary :

Color transparency (CT) phenomena in elastic electroproduction of vector mesons off nuclei are usually infected by the onset of coherence length (CL) effects. We analyze the problem of CT-CL separation at different energies and find that at low CLAS energies at Jefferson Lab (JLab), one can study practically the net CT effects, since CL is much shorter than the nuclear radius. We investigate various manifestations of CT effects using rigorous quantum mechanical approach based on the path integral technique. Motivated by the last data from the CLAS experiment at JLab, we predict the  $A$ ,  $Q^2$  and  $l_c$  dependence of nuclear transparency for  $\rho$  mesons produced incoherently off nuclei.

**Primary authors** : Dr. NEMCHIK, Jan (Czech Technical University in Prague, Prague, Czech Republic & Institute of Experimental Physics, Kosice, Slovakia)

**Co-authors** : Prof. KOPELIOVICH, Boris (Universidad Técnica Federico Santa María, Valparaiso, Chile) ; Prof. POTASHNIKOVA, Irina (Universidad Técnica Federico Santa María, Valparaiso, Chile)

**Presenter** : Dr. NEMCHIK, Jan (Czech Technical University in Prague, Prague, Czech Republic & Institute of Experimental Physics, Kosice, Slovakia)

**Session classification** : Diffraction in e-p Collisions (III)

**Track classification** : Diffraction in DIS (phenomenology/theory)

**Type** : Talk at plenary session

Contribution ID : 20

# Quarkonium+ $\gamma$ production in $\gamma$ -proton interactions at LHC

Wednesday 12 Sep 2012 at 08:50 (00h20')

## Summary :

The quarkonium plus photon production in coherent hadron - hadron interactions at LHC is studied using the non-relativistic QCD (NRQCD) factorization formalism.

Considering two different sets of NRQCD matrix elements we estimate the rapidity distribution and total cross sections for  $J/\Psi + \gamma$  and  $\Upsilon + \gamma$  production. Our results demonstrate that the experimental analysis of this process is feasible and that it can be used to constrain the matrix elements.

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**Presenter** : Dr. MELO MACHADO, Mairon (IF FARROUPILHA, Campus São Borja)

**Session classification** : Diffraction in Hadron-Hadron Collisions (I)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 21

# NEW RESULTS OBTAINED WITH TRANSVERSELY POLARIZED PROTONS IN P-P COLLISIONS AT RHIC

Wednesday 12 Sep 2012 at 15:30 (00h20')

## Summary :

STAR has released new mid-rapidity measurements of: the Collins effect in jets, interference fragmentation functions ( IFFs ) and the first clear signatures of quark transversity in p+p collisions at RHIC. Knowledge about Transversity Distributions is essential for a complete picture of the spin structure of the protons. In proton-proton collisions, the spin dependent azimuthal distributions of hadrons inside of jets is sensitive to the convolution of the transversity and Collins distributions. Existing asymmetry measurements obtained prior to year 2012 will be presented. These measurements are limited by statistical and systematic errors. They will be improved substantially in the future.

**Primary authors :** Prof. IGO, George (University of California, Los Angeles)

**Co-authors :**

**Presenter :** Prof. IGO, George (University of California, Los Angeles)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session



Contribution ID : 22

# PDF Studies of Hadronization Mechanisms using Pion Electroproduction in Deep Inelastic Scattering from Nuclei

Wednesday 12 Sep 2012 at 19:40 (00h20')

## Summary :

Results for data analysis of Jefferson Lab experiment E02-104 will be presented. These data give an opportunity to investigate the modifications of fragmentation functions in the nuclear medium, and the energy loss of quarks in the in-medium hadronization process. The first observable measured is the hadronic multiplicity ratio, which is a measure of the modification of the medium-modified fragmentation functions. The second observable is the broadening of the distributions in hadron transverse momentum, the transverse momentum broadening. It is expected that the hadron production time can be estimated from this variable within certain kinematic regions.

**Primary authors :** Dr. HAKOBYAN, Hayk (Universidad Tecnica Federico Santa Maria) ; Dr. BROOKS, William (Universidad Tecnica Federico Santa Maria)

**Co-authors :**

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**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 23

# On the use of the high energy effective action for low x phenomenology

Saturday 15 Sep 2012 at 10:10 (00h20')

## Summary :

We present recent results on the high energy effective action proposed by Lipatov in 1995. After a short introduction we show how the effective action can be used to calculate next-to-leading order (NLO) corrections to cross-sections in the high energy limit. As explicit examples we consider NLO corrections for the forward jet impact factor from the effective action and real NLO corrections to the Mueller-Tang impact factor, where the latter is needed to describe jet events with rapidity gaps. In a second part we discuss applications of the effective action to the description of amplitudes with multiple (reggeized) gluon exchange and discuss its relation to other approaches.

**Primary authors :** Mr. HENTSCHINSKI, Martin (BNL)

**Co-authors :**

**Presenter :** Mr. HENTSCHINSKI, Martin (BNL)

**Session classification :** Progress in QCD (II)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 25

# Evolution of cusped light-like Wilson loops, TMDs and geometry of the loops space

Saturday 15 Sep 2012 at 11:10 (00h20')

## Summary :

We discuss a relationship of geometrical properties of the loops space described by means of the Polyakov-Makeenko-Migdal (PMM) approach with energy/rapidity evolution of cusped Wilson loops on the light-cone. We propose to consider the renormalization properties of the light-cone cusped Wilson loops from the point of view of the universal geometrical PMM approach that corresponds to the Dyson-Schwinger set of equations for the loop space. We discuss the relevance of the PMM to energy/rapidity evolution of some phenomenologically significant objects, e.g., TMD and collinear PDFs, etc.

**Primary authors** : Dr. CHEREDNIKOV, Igor (Universiteit Antwerpen)

**Co-authors** : Mr. MERTENS, Tom (Universiteit Antwerpen) ; Mr. VAN DER VEKEN, Frederik (Universiteit Antwerpen)

**Presenter** : Mr. VAN DER VEKEN, Frederik (Universiteit Antwerpen)

**Session classification** : Progress in QCD (III)

**Track classification** : Progress in QCD

**Type** : Talk at plenary session

Contribution ID : 27

# Violent Collisions of Spinning Protons: Past, Present & Perhaps at Fermilab

Wednesday 12 Sep 2012 at 12:15 (00h25')

**Summary :**

First will be a review of the history of elastic scattering and polarized proton beams, and the unexpected and still unexplained large transverse spin effects found in high energy proton-proton spin experiments at the ZGS, CERN, AGS, Fermilab and RHIC. Next, will be a discussion of possible transverse spin experiments on violent elastic and inclusive collisions of polarized protons at Fermilab's new high-intensity Main Injector.

**Primary authors :** Prof. KRISCH, Alan (University of Michigan)

**Co-authors :**

**Presenter :** Prof. KRISCH, Alan (University of Michigan)

**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 28

# Orbital Angular Momentum in Nucleon

Wednesday 12 Sep 2012 at 11:25 (00h15')

**Summary :**

We use Ji's decomposition of nucleon spin and calculate the Orbital Angular Momentum of quarks and gluon in the nucleon. Calculations are carried out in the next to leading order utilizing the so-called valon model. It is found that the average quark orbital angular momentum is positive, but small, and the average gluon orbital angular momentum is negative and large. We also report on some regularities about the total angular momentum of the quarks and the gluon, as well as on the orbital angular momentum of the separate partons.

**Primary authors :** Prof. ARASH, Firooz (Physics Department, Tafresh University, Tafresh, Iran)

**Co-authors :**

**Presenter :** Prof. ARASH, Firooz (Physics Department, Tafresh University, Tafresh, Iran)

**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 29

# Transverse spin asymmetries in the CNI region in polarized proton-proton elastic scattering at STAR

Wednesday 12 Sep 2012 at 15:50 (00h15')

## Summary :

We shall present the result on single spin asymmetry ( $A_N$ ) in polarized proton-proton scattering at  $\sqrt{s} = 200$  GeV in small four momentum transfer region. With the Roman Pots of the pp2pp experiment, installed at the STAR detector at RHIC, a data sample of about 20 million elastic events in  $-t$  range of  $0.005-0.035 \text{-(GeV/c)}^2$  was analyzed. A fit of  $t$ -dependence of  $A_N$  indicates that a hadronic spin-flip amplitude is comparable to zero. The preliminary result from the same data sample on double spin asymmetries  $A_{NN}$  and  $A_{SS}$  is that they are of the order of  $10^{-3}$ , which implies negligible hadronic double spin-flip amplitude and disfavors contribution Reggeons other than the Pomeron. Pla

**Primary authors :** Dr. GURYN, Wlodek (Brookhaven National Laboratory)

**Co-authors :**

**Presenter :** Dr. GURYN, Wlodek (Brookhaven National Laboratory)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 30

# All-loop calculations of total, elastic and diffractive cross sections in RFT via the stochastic approach

Friday 14 Sep 2012 at 11:50 (00h20')

## Summary :

The evolution equations for the exact Green functions of the Reggeon Field Theory (RFT) are equivalent to those for the inclusive probability distributions for a reaction-diffusion system of classical particles. This equivalence can be used to obtain numerically the RFT Green functions and amplitudes with account of all loops and enhanced graphs. We developed a numerical approach based on this equivalence which allows us to compute the elastic scattering amplitude and its single-diffractive cut. Using it we perform all-loop calculation of the total, elastic and single diffractive (high- and low-mass) cross sections and compare results with the experimental data.

**Primary authors :** KOLEVATOV, Rodion (SUBATECH/UiO/SPbSU)

**Co-authors :** BORESKOV, Konstantin (ITEP)

**Presenter :** KOLEVATOV, Rodion (SUBATECH/UiO/SPbSU)

**Session classification :** Diffraction in Hadron-Hadron Collisions (III)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 31

# A New, Analytic, Non-Perturbative, Gauge-Invariant Formulation of Realistic QCD

Friday 14 Sep 2012 at 15:30 (00h25')

## Summary :

This presentation will describe in some detail each of the adjectives of the title. This approach is less than three years old; it is analytic in the sense that QCD amplitudes can be estimated using pencil and paper, or calculated in terms of Meijer G-functions; formal gauge invariance can be assured by a long-overlooked rearrangement of the Schwinger Generating Functional, and is made explicit as all gauge-dependent gluon propagators cancel as the sum of all gluon exchanges between any pair of quark lines is performed. Two, new non-perturbative properties appear, Effective Locality, and a need for Transverse Imprecision. Quark-quark and nucleon-nucleon binding potentials are easily found.

**Primary authors** : Prof. FRIED, Herbert (Brown University)

**Co-authors** :

**Presenter** : Prof. FRIED, Herbert (Brown University)

**Session classification** : Saturation

**Track classification** : Saturation

**Type** : Talk at plenary session



Contribution ID : 33

# Measurements of Proton-Proton Elastic Scattering and Total Cross-Section at the LHC by TOTEM

Saturday 15 Sep 2012 at 08:30 (00h20')

## Summary :

TOTEM has measured elastic pp scattering at  $\sqrt{s} = 7$  TeV to  $|t|$  as low as  $5 \times 10^{-3}$  GeV<sup>2</sup>. The data were taken in several runs with special beam optics ( $\beta^* = 90$  m) and Roman Pot detectors placed as close as  $4.8 \sigma$  from the outgoing beams. In addition, the inelastic rates were recorded with the telescopes T1 and T2 for  $5.3 < |\eta| < 6.4$ . Thus the total pp cross-section could be measured with 3 different techniques: (1) the luminosity-independent method via the optical theorem (OT); (2) also via the OT but using only  $d\sigma(\text{el}) / dt (t=0)$  with the lumi from CMS; (3) as direct sum of elastic and inelastic cross-sections with the lumi from CMS. All results agree within their errors.

**Primary authors** : Dr. DEILE, Mario (CERN)

**Co-authors** :

**Presenter** : Dr. DEILE, Mario (CERN)

**Session classification** : Forward physics in Hadron-Hadron Collisions (II)

**Track classification** : Forward physics in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 34

# An AdS/QCD holographic wavefunction for the rho meson

Tuesday 11 Sep 2012 at 19:30 (00h20')

**Summary :**

We show that AdS/QCD generates predictions for the rate of diffractive  $\rho$ -meson electroproduction that are in agreement with data collected at the HERA electron-proton collider.

**Primary authors :** Dr. SANDAPEN, Ruben (Université de Moncton)

**Co-authors :** Prof. FORSHAW, Jeff (University of Manchester)

**Presenter :** Dr. SANDAPEN, Ruben (Université de Moncton)

**Session classification :** Diffraction in e-p Collisions (III)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 36

# Parton distributions with LHC data

Tuesday 11 Sep 2012 at 12:10 (00h20')

## Summary :

I will present the first determination of parton distributions of the nucleon at NLO and NNLO based on a global data set which includes LHC data: NNPDF2.3.

I will also present some preliminary results coming from the introduction of an intrinsic charm component in PDF determination.

**Primary authors** : Mr. BERTONE, Valerio (Freiburg University and CERN)

**Co-authors** :

**Presenter** : Mr. BERTONE, Valerio (Freiburg University and CERN)

**Session classification** : Diffraction in e-p Collisions (I)

**Track classification** : Diffraction in DIS (phenomenology/theory)

**Type** : Talk at plenary session

Contribution ID : 37

# The Color Dipole Picture

Friday 14 Sep 2012 at 16:15 (00h20')

## Summary :

I review the CDP approach to DIS at low  $x$   $\cong Q^2/W^2 < 0.1$ . All essential experimental results can be theoretically obtained model-independently, i.e. without a specific free-parameter-dependent ansatz for the dipole cross section. The limits of color transparency and saturation, in terms of the Compton-forward-scattering amplitude, correspond to a two-channel versus a one-channel interaction of the color dipole with the gluon field in the nucleon. The connection with the pQCD-improved parton model is elaborated on. Compare also my recent review talks arXiv: 1112.2885 and my presentation given at the International Summer School of Subnuclear Physics 2012 (Erice, 23 June -- 2 July 2012),

**Primary authors :** Prof. SCHILDKNECHT, Dieter (Universitaet Bielefeld)

**Co-authors :**

**Presenter :** Prof. SCHILDKNECHT, Dieter (Universitaet Bielefeld)

**Session classification :** Saturation

**Track classification :** Saturation

**Type :** Talk at plenary session

Contribution ID : 38

# Probing the phase of the elastic pp scattering amplitude with vortex proton beams

Friday 14 Sep 2012 at 11:10 (00h20')

## Summary :

I show that by colliding vortex proton beams (that is, non-plane-wave states with spiral phase fronts associated with non-zero orbital angular momentum) one can probe the phase of the elastic pp scattering amplitude in a novel way, which is inaccessible in the usual plane wave collisions.

I will describe the main idea and list the requirements that need to be satisfied for a proof-of-principle experiment realizing this suggestion.

**Primary authors :** Dr. IVANOV, Igor (University of Liege and Institute of Mathematics, Novosibirsk)

**Co-authors :**

**Presenter :** Dr. IVANOV, Igor (University of Liege and Institute of Mathematics, Novosibirsk)

**Session classification :** Diffraction in Hadron-Hadron Collisions (III)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 40

# Accessing the quark orbital angular momentum with Wigner distributions

Wednesday 12 Sep 2012 at 11:05 (00h20')

## Summary :

The quark orbital angular momentum (OAM) has been recognized as an important piece of the proton spin puzzle. A lot of effort has been invested in trying to extract it quantitatively from the generalized parton distributions (GPDs) and the transverse-momentum dependent parton distributions (TMDs), which are accessed in high-energy processes and provide three-dimensional pictures of the nucleon. Recently, we have shown that it is more natural to access the quark OAM from the phase-space or Wigner distributions. We discuss the concept of Wigner distributions in the context of quantum field theory and show how they are related to the GPDs and the TMDs. We summarize the different definitions dis

**Primary authors :** Dr. LORCE, Cedric (IPNO and LPT Orsay, Universite Paris-Sud)

**Co-authors :**

**Presenter :** Dr. LORCE, Cedric (IPNO and LPT Orsay, Universite Paris-Sud)

**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 41

# Results on diffraction from the ATLAS experiment

Thursday 13 Sep 2012 at 12:10 (00h20')

**Summary :**

Available results on diffraction from the ATLAS experiment are summarized.

**Primary authors :** Mr. TASEVSKY, Marek (Institute of Physics of ASCR, Prague)

**Co-authors :**

**Presenter :** Mr. TASEVSKY, Marek (Institute of Physics of ASCR, Prague)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 42

# Accounting for soft cross sections at the LHC

Friday 14 Sep 2012 at 09:30 (00h20')

## Summary :

We show that the full GLM model with a tuned Pomeron intercept  $\alpha_P = 0.23$  provides a good description of all available pp and  $\bar{p}p$  data for  $\sigma_{tot}$ ,  $\sigma_{el}$ ,  $\sigma_{sd}$ ,  $\sigma_{dd}$  and  $B_{el}$ , over the energy range  $20 < W < 7000$  GeV. We compare our results with experimental data and other models on the market, with emphasis on recent LHC results.

**Primary authors** : Prof. GOTSMAN, Errol (Tel Aviv University) ; Prof. LEVIN, Evgeny (Tel Aviv University)

**Co-authors** : Prof. LEVIN, Evgeny (Tel Aviv University) ; Prof. MAOR, Uri (Tel Aviv University)

**Presenter** : Prof. GOTSMAN, Errol (Tel Aviv University)

**Session classification** : Diffraction in Hadron-Hadron Collisions (II)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session



Contribution ID : 43

# Inclusive production of a pair of rapidity-separated, high $p_t$ hadrons in proton collisions.

Saturday 15 Sep 2012 at 12:10 (00h20')

## Summary :

We consider the inclusive process where the pair of identified hadrons having large transverse momenta is produced in high-energy proton-proton collisions. We concentrate on the kinematics where the two identified hadrons in the final state are separated by a large interval of rapidity. In this case the cross section receives large higher order corrections, which can be resummed in the BFKL approach. We provide a theoretical input for the resummation of such contributions with next-to-leading logarithmic accuracy. This process has much in common with the widely discussed Navelet jets production and can be also used to access the BFKL dynamics at proton colliders.

**Primary authors** : Dr. IVANOV, Dmitry (Sobolev Institute of Mathematics)

**Co-authors** : Prof. PAPA, Alessandro (Universita` della Calabria)

**Presenter** : Dr. IVANOV, Dmitry (Sobolev Institute of Mathematics)

**Session classification** : Progress in QCD (III)

**Track classification** : Progress in QCD

**Type** : Talk at plenary session

Contribution ID : 44

# CMS results on central exclusive production

Saturday 15 Sep 2012 at 09:10 (00h20')

**Summary :**

We present a search for central exclusive diphoton production and the measurement of central exclusive dilepton production, based on a data sample recorded by the CMS experiment at the LHC in 2010 with low-pileup condition. An upper limit on the diphoton production cross section is set at 95% confidence level, and a comparison between the measurement and the QED prediction is discussed for dielectron production. The measured cross section of exclusive dimuon production is compared with the theoretical QED prediction evaluated with the event generator LPAIR.

**Primary authors :** Mr. LI, Wenbo (Peking University)

**Co-authors :**

**Presenter :** Mr. LI, Wenbo (Peking University)

**Session classification :** Forward physics in Hadron-Hadron Collisions (II)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 45

# The current stage of understanding and description of hadronic elastic diffraction

Friday 14 Sep 2012 at 12:30 (00h20')

**Summary :**

The current situation with the phenomenological description of the high energy diffractive elastic nucleon-nucleon scattering is reviewed. Comparison of various model predictions with the recent D0 and TOTEM data on the total and differential cross-sections is presented.

**Primary authors :** Dr. GODIZOV, Anton (IHEP (Protvino))

**Co-authors :**

**Presenter :** Dr. GODIZOV, Anton (IHEP (Protvino))

**Session classification :** Diffraction in Hadron-Hadron Collisions (III)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 46

# Partonic description of soft high energy pp interactions

Friday 14 Sep 2012 at 08:50 (00h20')

**Summary :**

Alternative s- and t-channel definitions of diffraction. Why study diffraction?  
Partonic description of "soft" high energy pp interactions, including diffraction.  
Possibility of including this model in the SHERPA Monte Carlo framework, forming the  
SHRiMPS MC = Soft-Hard Reactions involving Mutli-Pomeron Scattering.

**Primary authors :** Prof. MARTIN, Alan (IPPP, Durham University)

**Co-authors :**

**Presenter :** Prof. MARTIN, Alan (IPPP, Durham University)

**Session classification :** Diffraction in Hadron-Hadron Collisions (II)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 47

# Low-mass Drell-Yan production at the LHC; and treatment of the infrared region in pQCD

Tuesday 11 Sep 2012 at 09:40 (00h20')

## Summary :

Predictions of low-mass Drell-Yan production at the LHC are known to depend sensitively on the choice of factorization and renormalization scales. The sensitivity can be greatly reduced by fixing the factorization scale of the LO contribution using the known NLO matrix element. So LHC experiments can make direct measurements of PDFs for very low  $x$ . A spin-off of this study highlights some problems of the treatment of the infrared region in perturbative QCD.

**Primary authors** : Prof. MARTIN, Alan (IPPP, Durham University)

**Co-authors** : DE OLIVEIRA, Emmanuel (Instituto de Fisica, San Paulo University) ; RYSKIN, Mikhail (PNPI, Gatchina, St Petersburg)

**Presenter** : Prof. MARTIN, Alan (IPPP, Durham University)

**Session classification** : LHC and Post-LHC (I)

**Track classification** : LHC and post-LHC

**Type** : Talk at plenary session

Contribution ID : 49

# Recent Results from the PHENIX Spin Program

Wednesday 12 Sep 2012 at 12:40 (00h25')

**Summary :**

The PHENIX experiment utilizes longitudinally and transversely polarized proton collisions with up to 510 GeV center of mass energy at the Relativistic Heavy Ion Collider (RHIC) to study the spin structure of the proton. Topics include the measurement of anti-quark helicity distribution functions via W production, the measurement of gluon helicity distribution functions, and the investigation of different mechanisms for the generation of transverse single spin asymmetries. We have reached an era of high enough luminosity and polarization (RHIC-II) to begin our investigation of low cross-section channels, such as the W. In this talk I will show recent results and discuss future prospects.

**Primary authors :** Prof. BARISH, Kenneth (UC Riverside)

**Co-authors :**

**Presenter :** Prof. BARISH, Kenneth (UC Riverside)

**Session classification :** Spin Physics (II)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 50

# Diffractive dijet production at CDF

Thursday 13 Sep 2012 at 11:30 (00h20')

**Summary :**

We present a measurement of dijet production at CDF from  $p\bar{p}$ -p collisions at 1.96 TeV at the Fermilab Tevatron using data collected by triggering on a high transverse momentum jet in coincidence with a recoil antiproton detected in a roman pot spectrometer. Results are presented for antiproton momentum loss fraction 0.03-0.1 and 4-momentum transfer squared  $t > -4 \text{ GeV}^2$  in the kinematic range of Bjorken- $x$  0.001-0.1 and jet transverse energy 10-100 GeV.

**Primary authors :** Prof. GOULIANOS, Konstantin (The Rockefeller University)

**Co-authors :**

**Presenter :** Prof. GOULIANOS, Konstantin (The Rockefeller University)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 51

# Predictions of diffractive cross sections in proton-proton collisions

Friday 14 Sep 2012 at 09:10 (00h20')

**Summary :**

Predictions for diffractive proton-proton cross sections at high energies are presented in terms of unitarized expressions and compared with results from the LHC and cosmic ray experiments. An implementation in PYTHIA8, which includes single diffraction, double diffraction and central diffraction is also presented and predictions are compared with features of available LHC results.

**Primary authors :** Prof. GOULIANOS, Konstantin (The Rockefeller University)

**Co-authors :**

**Presenter :** Prof. GOULIANOS, Konstantin (The Rockefeller University)

**Session classification :** Diffraction in Hadron-Hadron Collisions (II)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session



Contribution ID : 52

# CMS results on soft and hard diffraction

Thursday 13 Sep 2012 at 11:50 (00h20')

**Summary :**

The talk will cover CMS recent results on soft and hard diffraction, including inclusive diffraction, hard-diffractive dijet production, and W and Z boson events with pseudorapidity gaps.

**Primary authors :** Prof. SOLANO, Ada Maria (TO)

**Co-authors :**

**Presenter :** Prof. SOLANO, Ada Maria (TO)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 53

# Description of the ATLAS jet veto measurement using the Banfi-Marchesini-Smye equation

Saturday 15 Sep 2012 at 12:50 (00h20')

**Summary :**

We present a new QCD description of the ATLAS jet veto measurement, using the Banfi-Marchesini-Smye equation to constrain the inter-jet QCD radiation. Applying alternative experimental cuts, we explore the possibilities for testing BFKL evolution with such a measurement.

**Primary authors :** Dr. MARQUET, Cyrille (University of Santiago de Compostela)

**Co-authors :**

**Presenter :** Dr. MARQUET, Cyrille (University of Santiago de Compostela)

**Session classification :** Progress in QCD (III)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 54

# Running Coupling Corrections to Nonlinear Evolution for Diffractive Dissociation

Friday 14 Sep 2012 at 16:35 (00h20')

**Summary :**

We present a new derivation of the non-linear evolution equation for the cross section of single diffractive dissociation in high energy DIS on a nucleus or a proton, resumming all multiple rescatterings and all leading logarithms of energy. We then determine running coupling corrections to the kernel of this non-linear evolution equation. The running coupling kernel for diffractive evolution is found to be exactly the same as the kernel of the rcBK evolution equation.

**Primary authors :** Prof. KOVCHegov, Yuri (The Ohio State University)

**Co-authors :**

**Presenter :** Prof. KOVCHegov, Yuri (The Ohio State University)

**Session classification :** Saturation

**Track classification :** Saturation

**Type :** Talk at plenary session

Contribution ID : 56

# Associated photon and heavy quark production within $k_T$ -factorization

Thursday 13 Sep 2012 at 10:30 (00h20')

## Summary :

In the framework of the  $k_T$ -factorization approach, the production of prompt photons in association with a heavy (charm or beauty) quarks at high energies is studied.

The analysis covers the total and differential cross sections and extends to specific angular correlations between the produced prompt photons and muons originating from the semileptonic decays of associated heavy quarks.

Our numerical predictions are compared with the recent experimental data taken by the D0 and CDF collaborations at the Tevatron. Finally, we extend our results to LHC energies.

**Primary authors :** ZOTOV, N.P. () ; LIPATOV, A.V () ; MALYSHEV, M.A. ()

**Co-authors :**

**Presenter :** ZOTOV, N.P. ()

**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 57

# Overview of Spin Studies at COMPASS

Wednesday 12 Sep 2012 at 16:55 (00h25')

**Summary :**

Recent results on the spin structure of the nucleon from the COMPASS experiment at CERN will be presented.

The gluon polarization in the nucleon was determined using open charm production and high transverse momentum hadron pair production in polarized muon scattering off longitudinally polarized target. The helicity distributions for the three lightest quark and antiquark flavours were extracted. Progress in the determination of quark fragmentation functions were also made via the measurement of pion and kaon multiplicities. Using transversely polarized deuteron and proton targets, the quark transversity distributions as well as the Sivers function and other Transverse Momentum Dependent

**Primary authors :** KUNNE, Fabienne (CEA Saclay IRFU / SPhN)

**Co-authors :**

**Presenter :** KUNNE, Fabienne (CEA Saclay IRFU / SPhN)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 59

# Forward Physics at LHCb

Friday 14 Sep 2012 at 19:15 (00h20')

## Summary :

Due to its unique pseudorapidity coverage and the possibility of providing measurements at low transverse momenta, LHCb allows a unique insight into particle production in the forward region at the LHC. We report on electroweak boson production at  $\sqrt{s}=7\text{TeV}$ , and Drell-Yan production, which is sensitive to Bjorken- $x$  values as low as  $1 \times 10^{-5}$ . We show results for exclusive dimuon production, both for muon pairs production through two photon fusion and observations of exclusive  $J/\psi$ ,  $\psi(0)$  and  $\chi_c$ . We present results on forward energy flow for inclusive minimum bias interactions, hard scattering processes and events with enhanced or suppressed fractions of diffractive contributions

**Primary authors :** VOLYANKSYY, Dmytro (MPI Heidelberg)

**Co-authors :**

**Presenter :** VOLYANKSYY, Dmytro (MPI Heidelberg)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 60

# Neutral meson production with ALICE at the LHC

Friday 14 Sep 2012 at 19:55 (00h20')

## Summary :

$\pi^0$  and eta meson production cross sections are presented for pp collisions at  $\sqrt{s} = 0.9, 2.76$  and 7 TeV. NLO perturbative QCD calculations overestimate  $\pi^0$  and eta mesons cross sections at  $\sqrt{s} = 7$  TeV, but agree with the measured  $\pi^0/\eta$  ratio.  $\pi^0$  production cross section is measured in Pb-Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV. The spectrum and the nuclear modification factor ( $R_{AA}$ ) of the  $\pi^0$  production at different centralities show a strong suppression with respect to pp collisions. Imbalance parameter  $x_E$  is presented for leading isolated  $\pi^0$  meson associated to a jet in opposite direction and compared with NLO calculations for pp collisions at  $\sqrt{s} = 7$  TeV.

**Primary authors :** Dr. BORISSOV, Alexander (Wayne State University, CERN)

**Co-authors :**

**Presenter :** Dr. BORISSOV, Alexander (Wayne State University, CERN)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 61

# Spin and diffractive physics with A Fixed-Target Experiment at the LHC (AFTER@LHC)

Friday 14 Sep 2012 at 12:50 (00h20')

## Summary :

We report on the spin and diffractive physics at a future multi-purpose fixed-target experiment with the p or Pb LHC beams extracted by a bent crystal. The LHC multi-TeV beams allow for the most energetic fixed-target experiments ever performed, opening new domains of particle and nuclear physics and complementing that of collider physics, in particular that of RHIC and the EIC projects. The luminosity achievable with AFTER using typical targets would surpass that of RHIC by more than 3 orders of magnitude. The fixed-target mode has the advantage to allow for measurements of single-spin asymmetries with polarized target as well as of single-diffractive processes in the target region.

**Primary authors :** LORCE, Cedric (IPNO and LPT Orsay, Universite Paris-Sud) ; ARNALDI, Roberta (INFN Sez. Torino, Via P. Giuria 1, I-10125, Torino, Italy) ; BRODSKY, Stanley J. (SLAC National Accelerator Laboratory, Theoretical Physics, Stanford University, Menlo Park, CA 94025, USA) ; CHAMBERT, Valerie (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; DIDELEZ, Jean-Pierre (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; GENOLINI, Bernard (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; FERREIRO, Elena G. (Departamento de Fisica de Particulas, Universidade de Santiago de Compostela, 15782 Santiago de Compostela, Spain) ; FLEURET, Frederic (Laboratoire Leprince Ringuet, Ecole Polytechnique, CNRS/IN2P3, 91128 Palaiseau, France) ; HADJIDAKIS, Cynthia (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; LANSBERG, Jean-Philippe (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; RAKOTOZAFINDRABE, Andry (IRFU/SPH, CEA Saclay, 91191 Gif-sur-Yvette Cedex, France) ; ROSIER, Philippe (IPNO, Universite Paris-Sud, CNRS/IN2P3, F-91406, Orsay, France) ; SCOMPARIN, Enrico (INFN Sez. Torino, Via P. Giuria 1, I-10125, Torino, Italy) ; UGGERHOEJ, Ulrik (Department of Physics and Astronomy, University of Aarhus, Denmark) ; SCHIENBEIN, Ingo (LPSC, Universite Joseph Fourier Grenoble 1, CNRS/IN2P3, INPG, Grenoble, F-38026, France)

## Co-authors :

**Presenter :** LORCE, Cedric (IPNO and LPT Orsay, Universite Paris-Sud)

**Session classification :** Diffraction in Hadron-Hadron Collisions (III)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session



Contribution ID : 62

# GPD physics with polarized muon beams at COMPASS

Tuesday 11 Sep 2012 at 18:30 (00h20')

## Summary :

A major part of the future COMPASS program is dedicated to the investigation of the nucleon structure through Generalised Parton Distributions (GPD).

COMPASS will measure DVCS and DVMP reactions with a high intensity muon beam of 160 GeV and a 2.5 m-long liquid hydrogen target surrounded by a new TOF system.

The availability of muon beams with high energy and opposite charge and polarization will allow to access the Compton form factor related to the dominant GPD  $H_1$  and to study the  $x_B$ -dependence of the  $t$ -slope of the pure DVCS cross section and to study nucleon tomography.

Projections on the achievable accuracies and preliminary results of pilot measurements will be presented.

**Primary authors :** Dr. FERRERO, Andrea (CEA-Saclay Irfu/SPhN)

**Co-authors :**

**Presenter :** Dr. FERRERO, Andrea (CEA-Saclay Irfu/SPhN)

**Session classification :** Diffraction in e-p Collisions (III)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 63

# Have we reached asymptotia in pp scattering?

Friday 14 Sep 2012 at 10:50 (00h20')

## Summary :

We discuss recent LHC data for total, inelastic and elastic pp scattering collected at 7 TeV. We use our Kt-resummation model to discuss the total and the inelastic cross-section, within the framework of a two component eikonal model. We then discuss the asymptotic properties of the scattering amplitude, such as saturation of the Froissart bound, the black disk and the Pomplun limit, the vanishing of the rho parameter. A simple model with two exponentials and a phase is used to describe the elastic differential cross-section for both pp and pbarp and test two asymptotic rules derived from the hypothesis of total absorption.

**Primary authors** : Dr. PANCHERI, Giulia (LNF)

**Co-authors** : Prof. SRIVASTAVA, Yogendra N. (INFN and U. Perugia) ; Prof. GRAU, Agnes (University of Granada) ; Dr. PACETTI, Simone (INFN and U. Perugia)

**Presenter** : Dr. PANCHERI, Giulia (LNF)

**Session classification** : Diffraction in Hadron-Hadron Collisions (III)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 65

# Mueller-Navelet jets in high energy hadron collisions

Saturday 15 Sep 2012 at 12:30 (00h20')

**Summary :**

We study the production of Mueller-Navelet jets in proton-proton collision using QCD collinear factorization. In particular we analyse the dependence of the differential cross section and the azimuthal decorrelation on the rapidity separation of the two tagged jets. The hard part of the observables is calculated in the complete next-to-leading order BFKL approach, taking the convolution of the BFKL Green's function with the jet vertices calculated in the "small cone" approximation.

**Primary authors :** Dr. CAPORALE, Francesco (Universita` della Calabria and INFN, Cosenza) ; Dr. IVANOV, Dmitry Yu. (Sobolev Institute of Mathematics, Novosibirsk) ; Dr. MURDACA, Beatrice (Universita` della Calabria and INFN, Cosenza) ; Prof. PAPA, Alessandro (Universita` della Calabria and INFN, Cosenza)

**Co-authors :**

**Presenter :** Dr. CAPORALE, Francesco (Universita` della Calabria and INFN, Cosenza)

**Session classification :** Progress in QCD (III)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 66

# Production of one and two $c\bar{c}$ pairs at LHC

Thursday 13 Sep 2012 at 10:10 (00h20')

## Summary :

We discuss charm production at LHC. The production of single  $c\bar{c}$  pairs is calculated in the  $k_t$ -factorization approach. We use several unintegrated gluon distributions from the literature. Some of them include effect of small- $x$  saturation and fulfill Balitsky-Kovchegov evolution equation. The hadronization is included with the help of fragmentation functions found for the production of  $c\bar{c}$  ( $c\bar{c}$ ) in  $e^+e^-$  collisions. Differential distributions for several charmed mesons will be presented and compared to recent results of the ALICE and LHCb collaborations. Some missing strength is identified. Different schemes of fragmentation are discussed. (...)

**Primary authors** : Prof. SZCZUREK, Antoni (Institute of Nuclear Physics PAN)

**Co-authors** :

**Presenter** : Prof. SZCZUREK, Antoni (Institute of Nuclear Physics PAN)

**Session classification** : Progress in QCD (I)

**Track classification** : Progress in QCD

**Type** : Talk at plenary session

Contribution ID : 67

# Exclusive production of meson pairs and resonances in proton-proton collisions

Friday 14 Sep 2012 at 11:30 (00h20')

## Summary :

We shall present results for the exclusive production of  $\pi^+ \pi^-$  and  $K^+ K^-$  pairs mediated by Pomeron and Reggeon exchanges, which constitute an irreducible background to resonance states (e.g.  $f_0(980)$ ,  $f_2(1270)$ ,  $f_0(1500)$ ,  $\chi_{c0}$ ).

We include absorption effects due to proton-proton interaction, pion/kaon rescattering and discuss differences between vectorial and tensorial

Pomeron for exclusive diffractive production of mesons.

We compare the results with the existing experimental data and present predictions for the RHIC, Tevatron and LHC colliders.

**Primary authors** : LEBIEDOWICZ, Piotr (IFJ PAN)

**Co-authors** : Prof. SZCZUREK, Antoni (IFJ PAN) ; ()

**Presenter** : LEBIEDOWICZ, Piotr (IFJ PAN)

**Session classification** : Diffraction in Hadron-Hadron Collisions (III)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 68

# An Improved Glauber-Gribov Approach to Diffractive Hadron-Nucleus Scattering

Wednesday 12 Sep 2012 at 19:20 (00h20')

## Summary :

By introducing nucleon short-range correlations and summing inelastic shadowing by the dipole representation [1], the cross sections for a variety of diffractive processes in proton-nucleus scattering, associated with large gaps in rapidity, are calculated at the energies of HERA-B, RHIC and LHC [2, 3]. Whereas Gribov inelastic shadowing makes nuclear matter more transparent, nucleon correlations act in the opposite direction.

[1] B. Z. Kopeliovich, Phys. Rev. C68 (2003) 044906

[2] M. Alvioli, C. Ciofi degli Atti, B. Z. Kopeliovich, I. K. Potashnikova and I. Schmidt, Phys. Rev. C81 (2010) 0252; C84 (2011) 025205

[3] C. Ciofi degli Atti, talk given at QNP12, Palaiseau, France. PoS 2012

**Primary authors** : Prof. CIOFI DEGLI ATTI, Claudio (PG)

**Co-authors** :

**Presenter** : Prof. CIOFI DEGLI ATTI, Claudio (PG)

**Session classification** : Diffraction in Nuclear Physics

**Track classification** : Diffraction in nuclear physics

**Type** : Talk at plenary session

Contribution ID : 69

# Central Exclusive Production with the STAR detector at RHIC

Wednesday 12 Sep 2012 at 18:40 (00h20')

**Summary :**

In this talk we shall present recent results on Central Exclusive Production from the STAR experiment at the RHIC in pp and AuAu collisions. We shall present the measurement of vector meson production in gold-gold ultra peripheral collisions. Comparisons to model calculations involving different initial conditions are discussed. We shall also present the preliminary result on invariant mass distribution of the pion production in proton-proton scattering with forward protons tagged using Roman Pots. The non-exclusive background estimated from events with like-sign track pairs does not exceed few percent. Plans for the future will also be discussed.

**Primary authors :** Dr. ADAMCZYK, Leszek (AGH University of Science and Tecnology)

**Co-authors :**

**Presenter :** Dr. ADAMCZYK, Leszek (AGH University of Science and Tecnology)

**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 70

# Photon impact factor and $k_T$ -factorization for DIS in the next-to-leading order

Saturday 15 Sep 2012 at 11:30 (00h20')

**Summary :**

The photon impact factor for the BFKL pomeron is calculated in the next-to-leading order (NLO) approximation using the operator expansion in Wilson lines.

The result is represented as a NLO  $k_T$ -factorization formula for the structure functions of small- $x$  deep inelastic scattering.

**Primary authors :** Prof. BALITSKY, Ian (ODU/JLab)

**Co-authors :**

**Presenter :** Prof. BALITSKY, Ian (ODU/JLab)

**Session classification :** Progress in QCD (III)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session



Contribution ID : 71

# Where is the proton missing spin?

Wednesday 12 Sep 2012 at 09:35 (00h25')

## Summary :

It has been over 20 years for the proton spin ``crisis",i.e., the puzzle of where is the proton missing spin. Here I make a review on the explanation that the proton missing spin is due to the relativistic effect of quark transversal motions.

More generally, the transversal motions of quarks play a significant role in various physical quantities related to the proton spin structure, such as the helicity and transversity distributions, and the transverse-momentum-dependent (TMD) or three-dimensional parton distributions (3dPDFs). It is shown that the relativistic effect due to quark transversal motions plays a crucial role to understand the proton spin puzzle.

**Primary authors** : Prof. MA, Bo-Qiang (Peking University)

**Co-authors** :

**Presenter** : Prof. MA, Bo-Qiang (Peking University)

**Session classification** : Spin Physics (I)

**Track classification** : Spin Physics

**Type** : Talk at plenary session

Contribution ID : 72

# Do we understand elastic scattering up to LHC energies?

Friday 14 Sep 2012 at 09:50 (00h20')

## Summary :

The measurements of high energy  $\bar{p}p$  elastic at ISR, SPS, and Tevatron colliders have provided useful informations on the behavior of the elastic scattering amplitude. A large step in energy domain is accomplished with the LHC collider presently running, giving a unique opportunity to improve our knowledge on the asymptotic regime of the elastic scattering amplitude and to verify the validity of our theoretical approach, to describe the total cross section  $\sigma_{\text{tot}}(s)$ , the total elastic cross section  $\sigma_{\text{el}}(s)$ , the ratio of the real to imaginary parts of the forward amplitude  $\rho(s)$  and the differential cross section  $d\sigma(s,t)/dt$ .

**Primary authors :** Prof. SOFFER, Jacques (Temple University, Philadelphia, PA, USA)

**Co-authors :**

**Presenter :** Prof. SOFFER, Jacques (Temple University, Philadelphia, PA, USA)

**Session classification :** Diffraction in Hadron-Hadron Collisions (II)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 73

# AMPLITUDES AND OBSERVABLES IN pp ELASTIC SCATTERING AT 7 TeV

Friday 14 Sep 2012 at 10:10 (00h20')

## Summary :

A complete analysis is performed of the recent pp elastic data at 7 TeV in terms of its real and imaginary amplitudes, that are fully disentangled, consistently with dispersion relations for amplitudes and for slopes.

Real and imaginary slopes  $B(R)$  and  $B(I)$ , treated as independent quantities, influence the whole  $t$ -range and the determination of the total cross section. The treatment includes prediction for the universal perturbative tail at large  $|t|$ .

New generalized expression is derived for the Coulomb phase.

Comparison is made of the values of total cross section and  $B(I)$  obtained in forward and full- $t$  approaches.

**Primary authors** : Mr. FERREIRA, Erasmo (Universidade Federal do Rio de Janeiro)

**Co-authors** : Mr. KOHARA, Anderson Kendi (Universidade Federal do Rio de Janeiro) ; Mr. KODAMA, Takeshi (Universidade Federal do Rio de Janeiro)

**Presenter** : Mr. FERREIRA, Erasmo (Universidade Federal do Rio de Janeiro)

**Session classification** : Diffraction in Hadron-Hadron Collisions (II)

**Track classification** : Diffraction in hadron-hadron collisions

**Type** : Talk at plenary session

Contribution ID : 74

# Overview of Spin Structure Program at Jefferson Lab

Wednesday 12 Sep 2012 at 16:30 (00h25')

## Summary :

An extensive experimental program to study spin physics at low and moderate four-momentum transfer,  $Q^2$ , has been pursued by Jefferson Lab during the last 15 years, with complementary measurements taking place in all 3 experimental halls. Our inclusive and semi-inclusive data with high statistical precision and extensive kinematic coverage allow us to better constrain the polarized parton distributions, to accurately determine various moments of spin structure functions, to test the spin content of valent quarks, and to investigate the effects of resonance excitations and higher twist, dominant in this kinematic regime. Highlights from 6 GeV experimental program will be shown

**Primary authors :** PROK, Yelena (Old Dominion University)

**Co-authors :**

**Presenter :** PROK, Yelena (Old Dominion University)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 75

# Exclusive meson production at COMPASS

Wednesday 12 Sep 2012 at 17:20 (00h15')

## Summary :

In this talk we will summarize recent measurements of exclusive meson production performed by the COMPASS Collaboration. In particular, recent results on the transverse target spin asymmetry  $A_{UT}^{\sin(\phi-\phi_s)}$  for exclusive  $\rho^0$  production will be presented. This asymmetry is sensitive to the 'elusive' GPD  $E$ , which is related to the orbital angular momentum of quarks. Also, planned measurements of exclusive meson production, which are a part of the approved COMPASS-II proposal, will be discussed.

**Primary authors :** Mr. SZNAJDER, Pawel (National Centre for Nuclear Research, Warsaw)

**Co-authors :**

**Presenter :** Mr. SZNAJDER, Pawel (National Centre for Nuclear Research, Warsaw)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 76

# NLO forward jet vertex

Saturday 15 Sep 2012 at 11:50 (00h20')

**Summary :**

We calculate in the BFKL approach the jet vertex relevant for the production of Mueller-Navelet jets in proton-proton collisions. We consider both cases of incoming quark and gluon and show explicitly that all infrared divergences cancel when renormalized parton densities are considered.

**Primary authors :** MURDACA, Beatrice (Universita` della Calabria and INFN, Cosenza) ;  
CAPORALE, Francesco (Universita` della Calabria and INFN, Cosenza) ;  
IVANOV, Dmitry (Sobolev Institute of Mathematics, Novosibirsk) ; PAPA,  
Alessandro (Universita` della Calabria and INFN, Cosenza) ; PERRI, Amedeo  
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**Co-authors :**

**Presenter :** MURDACA, Beatrice (Universita` della Calabria and INFN, Cosenza)

**Session classification :** Progress in QCD (III)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 77

# Measurement of the inelastic pp Cross Section with the ATLAS detector

Friday 14 Sep 2012 at 18:55 (00h20')

**Summary :**

Measurement of the inelastic cross-section for proton-proton collisions at centre-of-mass energy  $\sqrt{s} = 7$  TeV using the ATLAS detector at the Large Hadron Collider are presented.

Events are selected by requiring hits on scintillator counters mounted in the forward region of the ATLAS detector with a dataset corresponding to an integrated luminosity of  $21 \text{ ub}^{-1}$ .

**Primary authors :** Mr. ZENIS, Tibor (CU Bratislava)

**Co-authors :**

**Presenter :** Mr. ZENIS, Tibor (CU Bratislava)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 78

# Bounds on soft scattering in the TeV-scale

Tuesday 11 Sep 2012 at 09:20 (00h20')

## Summary :

A conceptual issue which is re-vitalized every few years is the rate at which the elastic p-p amplitude is getting closer to saturation. Our expectations for a decisive new experimental information are very low. AUGER has delivered, thus far, data of interest at 57 TeV from which block has calculated the value of  $\sigma_{\text{inel}}$ . Having no better option, I have scanned a few updated phenomenological models and have reached the conclusion that, unless some unexpected feature of soft scattering will be discovered, the elastic p-p amplitude is nor expected to ever become saturated.

**Primary authors :** MAOR, Uri (Tel Aviv University)

**Co-authors :**

**Presenter :** MAOR, Uri (Tel Aviv University)

**Session classification :** LHC and Post-LHC (I)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session



Contribution ID : 79

# Photoproduction of vector mesons: from gamma proton to nucleus nucleus collisions

Wednesday 12 Sep 2012 at 17:55 (00h20')

## Summary :

Experiments on vector meson photoproduction have been a testbed of ideas on the production mechanism, the QCD Pomeron exchange. High energy protons or ions are the source of a flux of Weizsäcker-Williams photons, which can be utilized to study the photoproduction of vector mesons also at colliders. We discuss how information on the small- $x$  gluon distribution in protons and nuclei can be obtained. We present our calculations based on a  $k_{\perp}$ -factorization approach which allows us to construct the unintegrated gluon of a nucleus from the free-nucleon one. Saturation effects are incorporated by an explicit treatment of the  $q\bar{q}$ -Fock state. We also discuss incoherent diffraction.

**Primary authors :** Prof. SCHAEFER, Wolfgang (Institute of Nuclear Physics PAN)

**Co-authors :**

**Presenter :** Prof. SCHAEFER, Wolfgang (Institute of Nuclear Physics PAN)

**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 80

# Central Diffraction in Proton-Proton Collisions at $\sqrt{s} = 7$ TeV with ALICE at LHC

Friday 14 Sep 2012 at 18:15 (00h20')

## Summary :

Felix Reidt for the ALICE Collaboration

In this analysis ALICE detectors covering the pseudorapidity region  $-3.7 < \eta < 5.1$ , were used to identify central diffractive events through a double-pseudorapidity-gap topology. Central diffraction is characterized experimentally by two pseudorapidity gaps accompanied by hadronic activity in the central pseudorapidity region between the gaps. This talk will summarize the latest results on properties of double-gap events with different gap sizes.

**Primary authors** : REIDT, Felix (Physikalisches Institut - University of Heidelberg)

**Co-authors** :

**Presenter** : REIDT, Felix (Physikalisches Institut - University of Heidelberg)

**Session classification** : LHC and Post-LHC (II)

**Track classification** : LHC and post-LHC

**Type** : Talk at plenary session

Contribution ID : 81

# Lipatov's Effective Action beyond Tree Level

Saturday 15 Sep 2012 at 10:30 (00h20')

**Summary :**

A consistent procedure avoiding the subtleties related with loops when using Lipatov's high-energy effective action has been recently devised. We explain it with some example computations and discuss its potential reach.

**Primary authors :** MADRIGAL, Jose' Daniel (Instituto de Fisica Teorica UAM/CSIS, Madrid)

**Co-authors :**

**Presenter :** MADRIGAL, Jose' Daniel (Instituto de Fisica Teorica UAM/CSIC, Madrid)

**Session classification :** Progress in QCD (II)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 83

# Momentum space dipole amplitude for DIS and inclusive hadron production

Friday 14 Sep 2012 at 16:55 (00h20')

## Summary :

The AGBS model, originally developed for deep inelastic scattering applied to HERA data on the proton structure function, can also describe the RHIC data on single inclusive hadron yield for  $d+Au$  and  $p+p$  collisions through a new simultaneous fit. The single inclusive hadron production is modeled through the color glass condensate, which uses the quark (and gluon) condensate amplitudes in momentum space. The Color Glass Condensate (CGC) is the description of the properties of saturated gluons in the infinite momentum frame in the Regge-Gribov limit. The effective degrees of freedom in this framework are color sources at large Bjorken- $x$  variable and gauge fields at small- $x$ . At high energies

**Primary authors :** GAY DUCATI, Maria Beatriz (UFRGS)

**Co-authors :**

**Presenter :** GAY DUCATI, Maria Beatriz (UFRGS)

**Session classification :** Saturation

**Track classification :** Saturation

**Type :** Talk at plenary session

Contribution ID : 84

# Inclusive Diffraction at HERA

Tuesday 11 Sep 2012 at 15:30 (00h20')

**Summary :**

to be specified

**Primary authors :** Dr. SALEK, David (IPNP, Charles University, Prague)

**Co-authors :**

**Presenter :** Dr. SALEK, David (IPNP, Charles University, Prague)

**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 85

# Combined inclusive diffractive cross sections measured with forward proton spectrometers at HERA

Tuesday 11 Sep 2012 at 15:50 (00h20')

## Summary :

A combination of the inclusive diffractive cross section measurements made by the H1 and ZEUS Collaborations at HERA is presented. The analysis uses diffractive deep inelastic scattering data measured by means of proton spectrometers. Correlations of systematic uncertainties are taken into account by the combination method, resulting in improved precision. The combined data cover the range  $2.5 < Q^2 < 200 \text{ GeV}^2$  in photon virtualities,  $0.00035 < x_{IP} < 0.09$  in fractional momentum losses,  $0.09 < |t| < 0.55 \text{ GeV}^2$  in four momentum transfer at the proton vertex and  $0.0018 < \beta < 0.56$  in  $\beta = x/x_{IP}$ , where  $x$  is the Bjorken scaling variable.

**Primary authors :** RUSPA, Marta (TO)

**Co-authors :**

**Presenter :** RUSPA, Marta (TO)

**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 86

# Diffractive Dissociation at COMPASS:

## $\pi^-$ to $(5\pi)^-$ at 190 GeV/c

Saturday 15 Sep 2012 at 09:30 (00h20')

### Summary :

The very first partial-wave decomposition of the  $(5\pi)^-$  system at COMPASS will be presented. We observe three new resonances,  $a_1(1900)$ ,  $a_1(2200)$  and  $\pi_2(2100)$ . Details of the analysis and the future prospects for the  $(5\pi)^-$  systems will be presented.

**Primary authors :** CHUNG, Suh-Urk (E18/TU Muenchen)

**Co-authors :**

**Presenter :** CHUNG, Suh-Urk (E18/TU Muenchen)

**Session classification :** Forward physics in Hadron-Hadron Collisions (II)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 87

# Diffractive production of charm quark/antiquark pairs at RHIC and LHC

Wednesday 12 Sep 2012 at 08:30 (00h20')

## Summary :

We have discussed single and central diffractive production of  $c\bar{c}$  pairs in the Ingelman-Schlein model. In these calculations we have included diffractive parton distributions obtained by the H1 collaboration at HERA and absorption effects neglected in some early calculations in the literature. The absorption effects which are responsible for the naive Regge factorization breaking cause that the cross section for diffractive processes is much smaller than that for the fully inclusive case, but could be measured at RHIC and LHC by imposing special condition on rapidity gaps. We discuss also a fully exclusive diffractive production of  $c\bar{c}$ . It was advocated recently that the cross section ...

**Primary authors :** LUSZCZAK, Marta (Institute of Nuclear Physics PAN, Cracow) ; Prof. SZCZUREK, Antoni (Institute of Nuclear Physics PAN, Cracow)

**Co-authors :**

**Presenter :** LUSZCZAK, Marta (Institute of Nuclear Physics PAN, Cracow)

**Session classification :** Diffraction in Hadron-Hadron Collisions (I)

**Track classification :** Diffraction in hadron-hadron collisions

**Type :** Talk at plenary session



Contribution ID : 88

# STAR: Characterizing Hot Quark Matter

Wednesday 12 Sep 2012 at 18:15 (00h25')

## Summary :

With discovery of Quark Gluon Plasma well-established at RHIC, the STAR Experiment continues to work towards a more complete understanding of properties of the produced matter, and the conditions necessary for the phase change. We will present recent progress on characterizing quark matter at high temperature through a wide variety of measurement techniques in STAR's repertoire: from observing species suppression and correlations, to determining statistical moments and prospecting for symmetry-breaking.

RHIC has further embarked on a program to study this matter through a range of conditions achieved by varying the collision energies, which are hoped to span and locate the QCD critical poi

**Primary authors :** Dr. VAN BUREN, Gene (Brookhaven National Laboratory)

**Co-authors :**

**Presenter :** Dr. VAN BUREN, Gene (Brookhaven National Laboratory)

**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 89

# On an evidence of higher twist emergence in DDIS at HERA

Tuesday 11 Sep 2012 at 16:50 (00h20')

**Summary :**

The HERA DDIS data on the diffractive structure functions at the lowest  $x$  and  $Q^2$  show a strong deviation from a twist-2 description, based on DGLAP fits. This deviation grows rapidly with decreasing  $x$  and  $Q^2$ , in consistence with an emergence of a significant higher twist contributions to diffractive proton structure functions. It is argued that the data provide an evidence for higher twist contributions to DDIS at HERA.

**Primary authors :** MOTYKA, Leszek (Jagiellonian University)

**Co-authors :**

**Presenter :** MOTYKA, Leszek (Jagiellonian University)

**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 90

# Polarizing Helium-3 for down quark spin enrichment

Wednesday 12 Sep 2012 at 20:00 (00h15')

## Summary :

The successful acceleration of unpolarized Helium-3 nuclei by the AGS at BNL heralds the possibility of achieving polarized He-3 ions at the AGS and RHIC. Assessing the level of polarization will be a challenge at high energy as the inelastic channels associated with He-3 scattering off a carbon target in the electromagnetic hadronic interference region may dilute expectations by comparison with the successful use of this method for proton polarimetry. The large anomalous magnetic moment of He-3 is helpful however, though the greater hadronic elastic cross section reduces the optimal analyzing power. Encouragement may be drawn from measurements indicating little high energy spin ...

**Primary authors :** BUTTIMORE, Nigel (Trinity College Dublin)

**Co-authors :**

**Presenter :** BUTTIMORE, Nigel (Trinity College Dublin)

**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 91

# News from the LHC

Tuesday 11 Sep 2012 at 08:30 (00h25')

**Summary :**

Recently the experiments at the LHC announced the the discovery of a new particle, a first of a kind ever seen.

In this presentation we will come back to the data that led to the discovery of this particle and also discuss some possible diffractive measurements that can lead to further insight on the nature of this particle.

**Primary authors :** DE ROECK, Albert (CERN)

**Co-authors :**

**Presenter :** DE ROECK, Albert (CERN)

**Session classification :** LHC and Post-LHC (I)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 92

# Status of the CMS High Precision Spectrometer Project

Saturday 15 Sep 2012 at 10:00 (00h10')

## Summary :

We have proposed to add proton detectors at +/- 240m, and later +/- 420m, with high precision silicon tracking (1 $\mu$ rad in angle) to measure the momenta of leading protons in central exclusive production:  $p + X + p$ . In Stage 1 (240m) X can be a W-pair, a jet-pair or (e.g) a high mass MSSM Higgs. In Stage 2 (420m) X can be a H(125) produced with no other particles, and its properties can be measured in a unique way. High pile-up background will be reduced by kinematics and precision timing (10ps). We hope for approval this year for installation of Stage 1 in 2014 (LS1).

**Primary authors :** ALBROW, Michael (FNAL)

**Co-authors :**

**Presenter :** ALBROW, Michael (FNAL)

**Session classification :** Forward physics in Hadron-Hadron Collisions (II)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 93

# Central Exclusive Production in CDF at the Tevatron p-pbar Collider

Thursday 13 Sep 2012 at 11:10 (00h20')

## Summary :

I present results on exclusive central production in p-pbar collisions, at the Tevatron in the CDF experiment. The reactions are in the class G-X-G, where G stands for a large rapidity gap ( $\Delta y > 4$ ) and X stands for a well-defined and measured central state. I present results on photon-photon collisions ( $X = e+e-$  and  $\mu+\mu-$ ), photon-pomeron collisions ( $X = J/\psi$ ,  $\psi(2S)$ ) and pomeron-pomeron collisions ( $X = \pi+\pi-$ ,  $K+K-$ ,  $\chi_c$ ,  $\gamma+\gamma$  and Jet+Jet).

**Primary authors :** ALBROW, Michael (FNAL)

**Co-authors :**

**Presenter :** ALBROW, Michael (FNAL)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 94

# Diffraction at HERA

Tuesday 11 Sep 2012 at 12:30 (00h30')

**Summary :**

In this talk I will review of the diffractive measurements at HERA with the focus on their physics message.

**Primary authors :** KOWALSKI, Henri (DESY)

**Co-authors :**

**Presenter :** KOWALSKI, Henri (DESY)

**Session classification :** Diffraction in e-p Collisions (I)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 95

# Nuclear Modification factor for gluon jet

Friday 14 Sep 2012 at 17:15 (00h20')

## Summary :

It is shown that the nuclear modification factor can be smaller than unity for jet production at small  $x_F$  and at large transverse momentum without any violation of the factorization theorem and the initial state effects lead to the value of the nuclear modification factor which is considerably smaller than unity.

**Primary authors :** LEVIN, Eugene (UTFSM and Tel Aviv University))

**Co-authors :**

**Presenter :** LEVIN, Eugene (UTFSM and Tel Aviv University))

**Session classification :** Saturation

**Track classification :** Saturation

**Type :** Talk at plenary session



Contribution ID : 96

# Recent results from low-x and forward physics at HERA

Tuesday 11 Sep 2012 at 11:00 (00h20')

## Summary :

The production of forward jets in inclusive as well as diffractive deep-inelastic scattering at HERA is studied with the H1 detector.

Inclusive deep-inelastic events at low photon virtuality  $Q^2$  with a forward jet, produced at small angles with respect to the proton beam, are measured with the H1 detector at HERA. A subsample of events with an additional jet in the central region is also studied. For both samples differential cross sections and normalised distributions are measured as a function of the azimuthal angle difference,  $\Delta\phi$ , between the forward jet and the scattered positron. The sensitivity to QCD evolution mechanisms is tested by comparing the data to ...

**Primary authors :** GOERLICH, Lidia (Institute of Nuclear Physics PAN, Cracow)

**Co-authors :**

**Presenter :** GOERLICH, Lidia (Institute of Nuclear Physics PAN, Cracow)

**Session classification :** Diffraction in e-p Collisions (I)

**Track classification :** Diffraction in DIS (phenomenology/theory)

**Type :** Talk at plenary session

Contribution ID : 97

# Measurements of Inelastic pp Interactions at the LHC

Thursday 13 Sep 2012 at 12:50 (00h20')

## Summary :

A survey of inelastic proton-proton scattering measurements at the LHC is carried out. In the light of recent elastic and total cross section measurements, the individual diffractive scattering processes are of primary importance in understanding the apparent discrepancies of the results.

**Primary authors :** Prof. ORAVA, Risto (Helsinki Inst. of Physics and Univ. of Helsinki, CERN)

**Co-authors :**

**Presenter :** Prof. ORAVA, Risto (Helsinki Inst. of Physics and Univ. of Helsinki, CERN)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 99

# Postcards from the High Energy Frontier

Tuesday 11 Sep 2012 at 08:55 (00h25')

**Summary :**

I will discuss what is new and important in terms of experiments, detectors, and results at the high-energy frontier defined by astroparticle and collider physics. I will concentrate where possible on the synergy between these two areas with regards to ultra high-energy cosmic ray physics, the search for dark matter and the search for new physics.

**Primary authors :** Prof. PINFOLD, James (University of Alberta)

**Co-authors :**

**Presenter :** Prof. PINFOLD, James (University of Alberta)

**Session classification :** LHC and Post-LHC (I)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 100

# Inclusive DIS at HERA and PDFs

Tuesday 11 Sep 2012 at 10:40 (00h20')

## **Summary :**

We review the H1 and ZEUS results on the measurements of the inclusive cross sections and structure functions in DIS at HERA. Particular emphasis will be given to the determination of the proton's PDFs obtained from the combined measurements of the HERA experiments.

**Primary authors :** Prof. TASSI, Enrico (Universita` della Calabria & INFN-Cosenza)

**Co-authors :**

**Presenter :** Prof. TASSI, Enrico (Universita` della Calabria & INFN-Cosenza)

**Session classification :** Diffraction in e-p Collisions (I)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 101

# Exclusive production at HERA

Tuesday 11 Sep 2012 at 18:10 (00h20')

## Summary :

The exclusive photoproduction reaction  $\gamma p \rightarrow \text{Upsilon}(1S) p$  has been studied with the ZEUS detector in ep collisions at HERA.

The exponential slope,  $b$ , of the  $t$  dependence of the cross section, where  $t$  is the squared four-momentum transfer at the proton vertex, has been measured. This constitutes the first measurement of the  $t$  dependence of the  $\gamma p \rightarrow \text{Upsilon}(1S) p$  cross section.

The differential cross sections as a function of  $t$  at lower energies were studied in exclusive diffractive photoproduction of  $J/\psi$  mesons with the H1 detector.

The exclusive electroproduction of two pions was measured by the ZEUS experiment. The two-pion invariant-mass distribution is interpreted in terms of the pion electromagnetic form factor, assuming that the studied mass range includes the contributions of the  $\rho$ ,  $\rho'$  and  $\rho''$  vector-meson states.

**Primary authors :** SZUBA, Dorota (UH Hamburg)

**Co-authors :**

**Presenter :** SZUBA, Dorota (UH Hamburg)

**Session classification :** Diffraction in e-p Collisions (III)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 103

# Overview of structure function measurements at Jefferson Lab

Tuesday 11 Sep 2012 at 11:50 (00h20')

**Summary :**

We review recent results on structure functions measured in inclusive deep-inelastic scattering at Jefferson Lab. Both spin-averaged and spin-dependent structure functions are summarized, covering the deep-inelastic and nucleon resonance regions, at intermediate and large values of  $x$ . Finally, we discuss the implications of the new data for global fits of parton distribution functions.

**Primary authors :** MELNITCHOUK, Wally (Jefferson Lab)

**Co-authors :**

**Presenter :** MELNITCHOUK, Wally (Jefferson Lab)

**Session classification :** Diffraction in e-p Collisions (I)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 104

# Low-x Physics results from CMS

Thursday 13 Sep 2012 at 12:30 (00h20')

**Summary :**

We report on recent results on forward and multiple hard jet production in pp collisions at CMS. Correlations between central and forward jet production are studied as well as additional jet radiation in events with dijets at large rapidity separation. Also the forward and very forward directed energy flow in pp and PbPb collisions are presented. Furthermore the inelastic cross-section measurement are discussed briefly.

**Primary authors :** ULRICH, Ralf (Karlsruhe Institut of Technology)

**Co-authors :**

**Presenter :** ULRICH, Ralf (Karlsruhe Institut of Technology)

**Session classification :** Forward physics in Hadron-Hadron Collisions (I)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 105

# Measurements of Diffractive and Inelastic Cross Section with ALICE at the LHC

Saturday 15 Sep 2012 at 08:50 (00h20')

**Summary :**

The ALICE collaboration has carried out measurements of the total inelastic and diffractive cross sections in pp interactions, using a van der Meer scan and an analysis based on the distributions of gaps in charged particle pseudorapidity distributions. The results, at  $\sqrt{s} = 0.9, 2.76$  and  $7$  TeV, will be presented. The results will be compared with other experimental results at the LHC and at lower energies, and with recent model calculations.

**Primary authors :** VILLALOBOS BAILLIE, Orlando (University of Birmingham)

**Co-authors :**

**Presenter :** VILLALOBOS BAILLIE, Orlando (University of Birmingham)

**Session classification :** Forward physics in Hadron-Hadron Collisions (II)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session



Contribution ID : 106

# Status of the ATLAS AFP project

Saturday 15 Sep 2012 at 09:50 (00h10')

**Summary :**

The ATLAS Forward Proton (AFP) project plans to add a set of detectors - silicon 3D pixel tracking detectors and QUARTIC time of flight detectors - in the ATLAS forward region around 210 m from the interaction point. The detectors are meant to detect protons outgoing from diffractive processes.

The detectors are to be housed in so called Hamburg beam pipe - a movable beam pipe allowing horizontal movement of the detectors.

The AFP is currently under approval with possible installation in 2013/14.

**Primary authors :** CHYTKA, Ladislav ()

**Co-authors :**

**Presenter :** CHYTKA, Ladislav ()

**Session classification :** Forward physics in Hadron-Hadron Collisions (II)

**Track classification :** Forward physics in hadron-hadron collisions

**Type :** Talk at plenary session

Contribution ID : 107

# Connections between diffraction in DIS and diffraction at the LHC

Tuesday 11 Sep 2012 at 16:10 (00h20')

**Summary :**

We review the HERA results and their unique contribution for the LHC program on diffraction.

**Primary authors :** CAPUA, Marcella (Universita` della Calabria & INFN, Cosenza)

**Co-authors :**

**Presenter :** CAPUA, Marcella (Universita` della Calabria & INFN, Cosenza)

**Session classification :** Diffraction in e-p Collisions (II)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session

Contribution ID : 108

# Integrability of the BKP equations for multi-reggeon composite states and new solutions for the Odderon problem in LLA

Thursday 13 Sep 2012 at 09:50 (00h20')

## Summary :

We review the integrability of the BKP equations in the multi-color QCD and discuss the duality symmetry of the reggeon Hamiltonian. Starting from the Bartels-Lipatov-Vacca solution for the Odderon wave function we construct new solutions of the duality operator using an iterative procedure in the integral of motion.

**Primary authors :** Prof. LIPATOV, Lev ()

**Co-authors :**

**Presenter :** Prof. LIPATOV, Lev ()

**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Invited Talk

Contribution ID : 109

# J/psi measurements in ultra-peripheral Pb-Pb collisions with ALICE

Wednesday 12 Sep 2012 at 19:00 (00h20')

## Summary :

The ALICE collaboration has studied J/psi photoproduction in ultra-peripheral Pb-Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV. The J/psi is measured via its dimuon decay in the forward rapidity region with the muon spectrometer for events where the hadronic activity is required to be minimal. In this talk, ALICE results for coherent J/psi production will be presented and compared to theoretical models.

**Primary authors :** TAPIA TAKAKI, Daniel (IPN Orsay, Paris-sud University)

**Co-authors :**

**Presenter :** TAPIA TAKAKI, Daniel (IPN Orsay, Paris-sud University)

**Session classification :** Diffraction in Nuclear Physics

**Track classification :** Diffraction in nuclear physics

**Type :** Talk at plenary session

Contribution ID : 110

# Status and Perspectives of ALICE at the LHC

Friday 14 Sep 2012 at 18:35 (00h20')

## Summary :

ALICE is one of the four large detectors at the LHC. It focuses on the study of heavy ion collisions at ultra-relativistic energies. Its main goal is to study in great detail the properties of matter under extreme energy densities. We discuss some aspects of the ALICE research program, the experiment future plans as well as some general items of the ALICE upgrade.

The present detector allows some studies on diffractive physics and photon photon induced processes. A new set of scintillation pad stations is successfully providing now beam diagnostic information. Integrating these detectors in the read out of the experiment would increase the efficiency for diffractive processes in proton proton collisions. These scintillation pads would tag the diffractive gap at larger rapidity values than those of the present coverage.

**Primary authors :** HERRERA CORRAL, Gerardo (CINVESTAV)

**Co-authors :**

**Presenter :** HERRERA CORRAL, Gerardo (CINVESTAV)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session

Contribution ID : 111

# Next-to-leading order corrections to the BKP evolution

Thursday 13 Sep 2012 at 09:30 (00h20')

**Summary :**

I report on the new calculation of a 3-body kernel. It is a part of the NLO corrections to the evolution of multi-gluon states.

**Primary authors :** Prof. BARTELS, Joachim (University Hamburg)

**Co-authors :**

**Presenter :** Prof. BARTELS, Joachim (University Hamburg)

**Session classification :** Progress in QCD (I)

**Track classification :** Progress in QCD

**Type :** Talk at plenary session

Contribution ID : 112

# Recent results on the gluon polarization and W production program in polarized p + p collisions at RHIC

Wednesday 12 Sep 2012 at 16:05 (00h25')

## Summary :

The PHENIX and STAR experiments at the Relativistic Heavy-Ion Collider at Brookhaven National Laboratory are carrying out a spin physics program in high-energy polarized proton collisions at  $\sqrt{s} = 200$  GeV and 500 GeV to gain a deeper insight into the spin structure and dynamics of the proton. One of the main objectives of the spin physics program at RHIC is the precise determination of the polarized gluon distribution function. Recent results will be shown on the measurement of jet production and hadron production at  $\sqrt{s} = 200$  GeV suggesting a small, but non-zero spin contribution of gluons to the proton spin. Recent results on the first measurements of W-/W+ boson production in polarized p-p collisions will be shown along with a discussion of future prospects involving upgraded PHENIX and STAR detector systems.

**Primary authors :** SURROW, Bernd (Temple University)

**Co-authors :**

**Presenter :** SURROW, Bernd (Temple University)

**Session classification :** Spin Physics (III)

**Track classification :** Spin Physics

**Type :** Talk at plenary session

Contribution ID : 113

# Physics Updates from HERMES

Tuesday 11 Sep 2012 at 11:20 (00h30')

**Summary :**

Recent DIS and exclusive results from the HERMES collaboration will be discussed. Of particular interest are the latest results on A2 and deeply virtual Compton scattering on a Hydrogen target. We also include the first measurement of the associated DVCS result on Hydrogen and its potential impact on previous HERMES results.

**Primary authors :** MURRAY, Morgan (University of Glasgow)

**Co-authors :**

**Presenter :** MURRAY, Morgan (University of Glasgow)

**Session classification :** Diffraction in e-p Collisions (I)

**Track classification :** Diffraction in e-p collisions (experiment)

**Type :** Talk at plenary session



Contribution ID : 114

# Low x: diffusion, screening, fusion

Friday 14 Sep 2012 at 15:55 (00h20')

## Summary :

A feasible mechanism of unitarization of amplitudes of deep inelastic scattering at small values of Bjorken  $x$  is the gluon fusion. However, its efficiency depends crucially on the vacuum color screening effect which accompanies the multiplication and the diffusion of BFKL gluons from small to large distances. From the fits to lattice data on field strength correlators the propagation length of perturbative gluons is  $R_c \simeq 0.2-0.3$  fermi. The probability to find a perturbative gluon with short propagation length at large distances is suppressed exponentially. It changes the pattern of (dif)fusion dramatically. The magnitude of the fusion effect appears to be controlled by the new dimensionless parameter  $\sim R_c^2/B$ , with the diffraction cone slope  $B$  standing for the characteristic size of the interaction region. It should slowly  $\propto 1/\ln Q^2$  decrease at large  $Q^2$ . Smallness of the ratio  $R_c^2/B$  makes the non-linear effects rather weak even at lowest Bjorken  $x$  available at HERA.

We report the results of our studies of the non-linear BFKL equation which has been generalized to incorporate the running coupling and the screening radius  $R_c$  as the infrared regulator.

**Primary authors :** ZOLLER, Vladimir (ITEP Moscow)

**Co-authors :**

**Presenter :** ZOLLER, Vladimir (ITEP Moscow)

**Session classification :** Saturation

**Track classification :** Saturation

**Type :** Talk at plenary session

Contribution ID : 115

# Low-mass, single- and double diffraction dissociation at the LHC

Friday 14 Sep 2012 at 17:55 (00h20')

## Summary :

Low missing mass, single and double diffraction dissociation (DD) is calculated for the LHC energies from a factorized dual-Regge model, with emphasis on the resonance structure in the missing mass channel. Detailed predictions for the missing mass ( $M$ ) and squared momentum transfer ( $t$ ) dependence of the differential cross sections for single and double diffraction dissociation as well as for the integrated cross sections are given. The model calculations are compared with the existing data, including those on elastic scattering measured by TOTEM. Various limits and ratios between single and double DD are presented.

**Primary authors :** Prof. JENKOVSZKY, Laszlo (BIPT Kiev)

**Co-authors :**

**Presenter :** Prof. JENKOVSZKY, Laszlo (BIPT Kiev)

**Session classification :** LHC and Post-LHC (II)

**Track classification :** LHC and post-LHC

**Type :** Talk at plenary session