

Hadron Structure and QCD (HSQCD'2018) Dedicated to the Memory of Lev N. Lipatov (2.05.1940 - 4.09.2017)



Report of Contributions

Contribution ID: 2

Type: **not specified**

Opening

Monday, 6 August 2018 11:50 (10 minutes)

Session Classification: Monday Morning

Contribution ID: 3

Type: **not specified**

Memories of Lev Lipatov, a scientist and a man

Monday, 6 August 2018 12:00 (1 hour)

Presenter: FADIN, Victor (BINP RAS)

Session Classification: Monday Morning

Contribution ID: 5

Type: **not specified**

Black disk, central diffraction and unitarity

Monday, 6 August 2018 14:30 (30 minutes)

Presenter: RYSKIN, Mikhail (Petersburg Nuclear Physics Institute)

Session Classification: Monday Afternoon

Contribution ID: 6

Type: **not specified**

QCD asymptotics at collider energies

Monday, 6 August 2018 15:00 (30 minutes)

Presenter: KIM, Victor (St. Petersburg Nuclear Physics Institute - PNPI, Gatchina & SPbPU, St.Petersburg)

Session Classification: Monday Afternoon

Contribution ID: 8

Type: **not specified**

Reggeon Webs, spin chains and the Odderon

Monday, 6 August 2018 16:20 (30 minutes)

We will discuss how to solve the Odderon problem in perturbative QCD and its relation to open spin chains in the N=4 super Yang-Mills theory.

Presenter: SABIO VERA, Agustin (Universidad Autonoma de Madrid (ES))

Session Classification: Monday Evening

Contribution ID: 9

Type: **not specified**

Memory recollection on Lev N. Lipatov

Monday, 6 August 2018 17:20 (30 minutes)

Session Classification: Monday Evening

Contribution ID: **10**

Type: **not specified**

Latest CMS results

Tuesday, 7 August 2018 09:30 (45 minutes)

Some latest Run II CMS results on Higgs measurements and Beyond the Standard Model physics searches are reviewed

Presenter: MITSELMAKHER, Guenakh (University of Florida (US))

Session Classification: Tuesday Morning

Contribution ID: 12

Type: **not specified**

Latest ATLAS results

Tuesday, 7 August 2018 10:15 (45 minutes)

Presenter: SOLOVYANOV, Oleg (Institute for High Energy Physics (RU))

Session Classification: Tuesday Morning

Contribution ID: 19

Type: **not specified**

Proton radius puzzle: theory vs experiment

Tuesday, 7 August 2018 14:30 (30 minutes)

Brief review of the proton radius problem is given. In the framework of the quasipotential method in quantum electrodynamics we calculate the contribution of light pseudoscalar (PS) and axial-vector (AV) mesons to the interaction operator of a muon and a proton in muonic hydrogen atom. The coupling of mesons with the muon is via two-photon intermediate state. The parametrization of the transition form factor of two photons into PS and AV mesons, based on the experimental data on the transition form factors and QCD asymptotics, is used. Numerical estimates of the contributions to the hyperfine structure of the spectrum of the S and P levels are presented. It is shown that such contribution to the hyperfine splitting in muonic hydrogen is rather important for a comparison with precise experimental data.

Presenter: DOROKHOV, Alexander (JINR)**Session Classification:** Tuesday Afternoon

Contribution ID: 22

Type: **not specified**

Present status of the determination of the proton radius

Tuesday, 7 August 2018 15:00 (30 minutes)

I will discuss the present status of the determination of the proton radius. Starting with 2010 there is a controversy within the results obtained from electron-proton scattering, hydrogen and deuterium spectroscopy and spectroscopy of muonic hydrogen and deuterium. I will briefly review the situation and its recent development.

Presenter: KARSHENBOIM, Savely (LMU & MPQ & Pulkovo Obs.)

Session Classification: Tuesday Afternoon

Contribution ID: 23

Type: **not specified**

Exotics hadron states at LHCb

Tuesday, 7 August 2018 16:20 (30 minutes)

The exotic hadrons, those, which have content beyond the conventional scheme of mesons, consisting of a quark and an antiquark, and baryons, consisting of three quarks, were predicted with the quark model itself. However first observation of an exotic candidate was made only less than 15 years ago. Since then quite a number of exotic-like states was discovered and some of them were proved to consist of more than three quarks. Various theoretical approaches predict different masses and quantum numbers of such states. Thus search for the new exotic hadrons and study of their properties is important for better understanding of their internal structure. The talk will cover the latest results on the topic from the LHCb experiment.

Presenter: SAVRINA, Daria (M.V. Lomonosov Moscow State University (RU))

Session Classification: Tuesday Evening

Contribution ID: 25

Type: **not specified**

Charm Physics at LHCb

Tuesday, 7 August 2018 16:50 (30 minutes)

Recent results of the LHCb experiment in the charm physics field will be presented. The contribution will cover spectroscopy of the charmed particles, search for their rare decays, as well as for CP violation effects in the charm sector.

Presenter: DZIUBA, Aleksei (Petersburg Nuclear Physics Institute (RU))

Session Classification: Tuesday Evening

Contribution ID: 26

Type: **not specified**

Latest results from LHCb

Tuesday, 7 August 2018 11:20 (45 minutes)

Latest results from LHCb experiment will be presented

Presenter: VOROBYEV, Vitaly (Budker Institute of Nuclear Physics (RU))

Session Classification: Tuesday Morning

Contribution ID: 29

Type: **not specified**

BSM searches with the ATLAS detector

Tuesday, 7 August 2018 12:35 (30 minutes)

We present the recent results on the confinement/deconfinement transition in lattice SU(2) QCD with two flavors of quarks at finite quark density and zero temperature. In the region $\mu_q \sim 1000$ MeV we observe the confinement/deconfinement transition which manifests itself in rising of the Polyakov loop and vanishing of the string tension σ . After the deconfinement is achieved at $\mu_q > 1000$ MeV we observe a monotonous decrease of the spatial string tension σ_s which ends up with σ_s vanishing at $\mu_q > 2000$ MeV. To study the properties of cold dense quark medium we measure the dependence of chiral and diquark condensates, quark density, topological susceptibility and other physical quantities on the chemical potential.

Presenter: BATTAGLIA, Marco (University of California,Santa Cruz (US))

Session Classification: Tuesday Morning

Contribution ID: 30

Type: **not specified**

The relativistic contribution of states with a nonzero orbital angular momentum to the binding energy and the form factors of the triton

Friday, 10 August 2018 11:50 (20 minutes)

Three nucleon system(triton) was considered. Relativistic properties of this system were investigated. For this relativistic generalization of Faddeev approach was used. As two particle T-matrix which contained in relativistic Faddeev equation we used solution of Bethe-Salpeter equation. So eventually we had Bethe-Salpeter-Faddeev(BSF) equation for describe three nucleon system. As potential of nucleon-nucleon(NN) interaction we used separable potential. Form factors of this potential taken in Yamaguchi-type function. Using of separable potential in particular allow to reduce integration on two variables into integration on one variable in BSF equation. Six states $1S_0, 3S_1, 3D_1, 3P_0, 3P_1$ and $1P_1$ with different angular momenta were considered. For this we made particle wave decomposition of BSF equation. System of 12 integral equations(for real and imaginary parts of amplitudes of $1S_0, 3S_1, 3D_1, 3P_0, 3P_1$ and $1P_1$ states) was solved with iteration method. Bound state energy of triton and amplitudes of S,P and D states was found. Amplitudes used for calculation electric and magnetic form factors of triton.

Presenter: YUREV, Sergey (JINR, Dubna)

Session Classification: Friday Morning

Contribution ID: 31

Type: **not specified**

Chiral imbalance: its manifestation in hadron matter

Monday, 6 August 2018 15:30 (30 minutes)

Chiral imbalance: its manifestation in meson decays. Instability of chiral charge density, possible generation by Schwinger effects

Presenter: ANDRIANOV, Alexander (Saint Petersburg State University)

Session Classification: Monday Afternoon

Contribution ID: 34

Type: **not specified**

Present status of neutrino oscillations

Wednesday, 8 August 2018 10:15 (45 minutes)

Presenter: KUDENKO, Yury (Russian Academy of Sciences (RU))

Session Classification: Wednesday Morning

Contribution ID: 35

Type: **not specified**

Astroparticle Physics at CERN

Wednesday, 8 August 2018 09:30 (45 minutes)

Results from ALICE Cosmic Ray Physics program and MATHUSLA Experiment Proposal

Presenter: FERNANDEZ TELLEZ, Arturo (Autonomous University of Puebla (MX))

Session Classification: Wednesday Morning

Contribution ID: 37

Type: **not specified**

Levy analysis of Bose-Einstein correlations in pp-collisions at 7 TeV measured with the ATLAS

Wednesday, 8 August 2018 12:00 (30 minutes)

Presenter: SCHEGELSKY, Valery (NRC KI - PNPI)

Session Classification: Wednesday Morning

Contribution ID: **38**

Type: **not specified**

EDM at storage rings: theory and experiment

Wednesday, 8 August 2018 11:20 (40 minutes)

Presenter: NIKOLAEV, Nikolay (Landau ITP RAS)

Session Classification: Wednesday Morning

Contribution ID: 40

Type: **not specified**

Highlights from the PHENIX experiment

Thursday, 9 August 2018 14:30 (45 minutes)

The PHENIX experiment at the relativistic heavy ion collider (RHIC) has finished data taking in 2016. However, a huge amount of data on p+p, p+A and A+A collisions taken at different collision energies in the last years of the detector operation is actively analysed by the collaboration and brings a wealth of new experimental results. In this talk, we present review of the most recent PHENIX results on the light and heavy flavor hadron production, yields and angular correlations of the direct photons, search for onset of collectivity in high multiplicity p+p and p+A collisions.

Presenter: RIABOV, Viktor (Petersburg Nuclear Physics Institut (RU))

Session Classification: Thursday Afternoon

Contribution ID: 42

Type: **not specified**

Recent results from STAR

Thursday, 9 August 2018 15:15 (45 minutes)

Presenter: NIGMATKULOV, Grigory (National Research Nuclear University MEPhI)

Session Classification: Thursday Afternoon

Contribution ID: 50

Type: **not specified**

Observation of Deconfinement in a Cold Dense Quark Medium

Thursday, 9 August 2018 16:20 (30 minutes)

We present the recent results on the confinement/deconfinement transition in lattice SU(2) QCD with two flavors of quarks at finite quark density and zero temperature. In the region $\mu_q \sim 1000$ MeV we observe the confinement/deconfinement transition which manifests itself in rising of the Polyakov loop and vanishing of the string tension σ . After the deconfinement is achieved at $\mu_q > 1000$ MeV we observe a monotonous decrease of the spatial string tension σ_s which ends up with σ_s vanishing at $\mu_q > 2000$ MeV. To study the properties of cold dense quark medium we measure the dependence of chiral and diquark condensates, quark density, topological susceptibility and other physical quantities on the chemical potential.

Presenter: BRAGUTA, Victor (ITEP)

Session Classification: Thursday Evening

Contribution ID: 52

Type: **not specified**

Dijet photoproduction in UPCs at the LHC and nuclear PDFs at small-x

Thursday, 9 August 2018 16:50 (30 minutes)

Presenter: GUZEY, Vadim (PNPI NRC KI)

Session Classification: Thursday Evening

Contribution ID: 54

Type: **not specified**

B baryon decays at LHCb

Tuesday, 7 August 2018 12:05 (30 minutes)

The talk will be on behalf of the LHCb Collaboration. The LHCb experiment is designed to study heavy hadrons produced in proton-proton collisions at the LHC. Charmed and beauty hadrons produced in the pp-collision are studied to identify new states, confirming or disproving those recently claimed, and establishing their quantum numbers. The latest results on heavy baryon decays based on the data collected by the LHCb experiment in Run-1 and Run-2 of LHC will be presented.

Presenter: MATIUNIN, Slava (Institute for Theoretical and Experimental Physics (RU))

Session Classification: Tuesday Morning

Contribution ID: 55

Type: **not specified**

Charge splittings in piN-Delta formfactors

Friday, 10 August 2018 12:10 (20 minutes)

Experimental data on πN scattering in the elastic energy region $W \leq 1.45 \text{ GeV}$ are analyzed within the K -matrix approach with effective Lagrangians. The charge splitting in δ_{33}^{++} and δ_{33}^0 phases obtained in the phase shift analysis is studied. It is shown that the change in the sign in the energy dependence of the phase difference can be obtained with different formfactors of the Δ^{++} and Δ^0 only. This means that Δ^{++} and Δ^0 has a different size in πN interaction. The underlying nature of the observed phenomena is discussed. $\pi N \Delta^{++}$ and $\pi N \Delta^0$ interactions has a different range.

Presenter: GRIDNEV, Anatoly (NRC KI - PNPI)

Session Classification: Friday Morning

Contribution ID: 62

Type: **not specified**

Prospects of discovering stable double-bottom tetraquarks

Tuesday, 7 August 2018 17:20 (25 minutes)

Presenter: PARKHOMENKO, Alexander (Yaroslavl State University)

Session Classification: Tuesday Evening

Contribution ID: 64

Type: **not specified**

Vorticity and particle polarization in heavy ion collisions

Thursday, 9 August 2018 12:05 (30 minutes)

Presenter: VOLOSHIN, Sergey (Wayne State University (US))

Session Classification: Thursday Morning

Contribution ID: 65

Type: **not specified**

Self-Similarity of Negative Particle Production in Au+Au Collisions at STAR

Thursday, 9 August 2018 12:35 (30 minutes)

Results of a new analysis of negative charged particle yields in $Au + Au$ collisions as a function of transverse momentum obtained by the STAR Collaboration for the first phase of the RHIC Beam Energy Scan Program in the framework of the z -scaling approach are presented. The spectra were measured over a wide range of collision energy $\sqrt{s_{NN}} = 7.7 - 200$ GeV and transverse momentum of produced particles in different centralities at $|\eta|$

Presenter: TOKAREV, Mikhail (Joint Institute for Nuclear Research)

Session Classification: Thursday Morning

Contribution ID: 67

Type: **not specified**

From pp to p-Pb, Pb-Pb and Xe-Xe Collisions in ALICE at the LHC

Thursday, 9 August 2018 11:20 (45 minutes)

We present highlights of recent studies by ALICE on energy and system size dependence of multi-particle production in pp, p-Pb and A-A collisions at various energies, investigations of production of light nuclei, including exotic states of hypernuclei, new flow-like effects and collective phenomena in small systems, long-range correlations in hadron collisions at the LHC, as well as the puzzles which are still unsolved (the unexpected signals of collectivity in small systems: the elliptic flow of D- mesons in p-Pb and strangeness yields increase in high multiplicity pp collisions, etc.). The new possibilities of the ALICE program, aimed at the precise studies of rare processes of heavy flavour formation, will be also touched briefly.

Presenter: Dr FEOFILOV, Grigori (St Petersburg State University (RU))

Session Classification: Thursday Morning

Contribution ID: 69

Type: **not specified**

Hadron amplitudes in composite superconformal string model

Thursday, 9 August 2018 17:20 (25 minutes)

Presenter: SEMENOVA, Alla

Session Classification: Thursday Evening

Contribution ID: 70

Type: **not specified**

Piano Concert by Oleg Weinstein

Monday, 6 August 2018 18:30 (1 hour)

Session Classification: Gatchina Pavel Palace: Concert & Welcome Party

Contribution ID: 71

Type: **not specified**

Welcome Party

Monday, 6 August 2018 19:30 (2 hours)

Session Classification: Gatchina Pavel Palace: Concert & Welcome Party

Contribution ID: 72

Type: **not specified**

Non-perturbative BFKL Pomeron from Integrability in N=4 SYM

Monday, 6 August 2018 16:50 (30 minutes)

Presenter: GROMOV, Nikolay (King's College London)

Session Classification: Monday Evening

Contribution ID: 73

Type: **not specified**

Project for Precision Measurement of the Proton Charge Radius in Electron-Proton Scattering

Tuesday, 7 August 2018 15:30 (30 minutes)

Presenter: VOROBYEV, Alexei (Petersburg Nuclear Physics Institut (RU))

Session Classification: Tuesday Afternoon

Contribution ID: 74

Type: **not specified**

Standard Model and Higgs physics with the ATLAS detector

Thursday, 9 August 2018 09:30 (30 minutes)

I will present the latest results from the ATLAS experiment on measurements of the Standard Model and Higgs boson production processes.

Presenter: JOVICEVIC, Jelena (TRIUMF (CA))

Session Classification: Thursday Morning

Contribution ID: 75

Type: **not specified**

Electroweak Z boson production with associated hadronic jets at CMS

Thursday, 9 August 2018 10:00 (30 minutes)

CMS data at 13 TeV for electroweak Z boson production with associated hadronic jets are presented. The measurement is based on data recorded in 2016 by the CMS experiment at the LHC corresponding to an integrated luminosity of 35.9 fb⁻¹. The measured cross section is in agreement within the experimental uncertainties with the standard model predictions in the leading order approximation.

Presenter: ORESHKIN, Vadim (Petersburg Nuclear Physics Institut (RU))

Session Classification: Thursday Morning

Contribution ID: 76

Type: **not specified**

Dijets with large rapidity separation at CMS

Thursday, 9 August 2018 10:30 (30 minutes)

Search for asymptotic BFKL effects at CMS in dijet events with large rapidity separation between jets in proton-proton collisions at 7 TeV is presented. CMS data on cross-section ratios and azimuthal decorrelations for dijets with large rapidity separation between jets are compared with predictions by various Monte Carlo event generators based on DGLAP and BFKL evolutions.

Presenter: MURZIN, Viktor (Petersburg Nuclear Physics Institut (RU))

Session Classification: Thursday Morning

Contribution ID: 77

Type: **not specified**

Baryons and Nuclei Structure at High p_T Processes

Presenter: SHIMANSKIY, Stepan (JINR, Dubna)

Session Classification: Thursday Evening

Contribution ID: 78

Type: **not specified**

Lipatov's effective action and S-matrix in high energy QCD

Wednesday, 8 August 2018 12:30 (30 minutes)

Presenter: BONDARENKO, Sergey (Ariel University)

Session Classification: Wednesday Morning

Contribution ID: **80**

Type: **not specified**

'Elliptic' multiloop integrals: the last stronghold

Wednesday, 8 August 2018 15:00 (30 minutes)

Presenter: LEE, Roman (Budker Institute of Nuclear Physics)

Session Classification: Wednesday Afternoon

Contribution ID: **81**

Type: **not specified**

Skewed Sudakov Regime

Wednesday, 8 August 2018 15:30 (30 minutes)

A new kinematic regime for the vertex functions of gauge theories is discussed

Presenter: PIVOVAROV, Grigory (Russian Academy of Sciences (RU))

Session Classification: Wednesday Afternoon

Contribution ID: 82

Type: **not specified**

BFKL equation and Regge cuts

Wednesday, 8 August 2018 14:30 (30 minutes)

The derivation of the BFKL equation based on the unitarity relations is strongly complicated in the next-to-next-to-leading logarithmic approximation. The main reason of the complication is appearance of Regge cuts in amplitudes with gluon quantum numbers in the cross channels and negative signature.

Presenter: FADIN, Victor (Budker Institute of Nuclear Physics)

Session Classification: Wednesday Afternoon

Contribution ID: 83

Type: **not specified**

High energy heavy quark hadroproduction in k_T factorization

Wednesday, 8 August 2018 16:45 (25 minutes)

Presenter: SHUVAEV, Andrey (NRC KI - PNPI)

Session Classification: Wednesday Evening

Contribution ID: **84**

Type: **not specified**

Angular correlations in particle pair production at LHC within the parton Reggeization approach

Wednesday, 8 August 2018 17:35 (25 minutes)

Presenter: SALEEV, Vladimir (Samara State University)

Session Classification: Wednesday Evening

Contribution ID: 85

Type: **not specified**

gamma-gamma induced processes of production of $W^+ W^-$, lepton-antilepton and quark-antiquark pairs with proton dissociation

Presenter: SZCZUREK, Antoni (Institute of Nuclear Physics)

Session Classification: Wednesday Evening

Contribution ID: **86**

Type: **not specified**

Baryons and Nuclei Structure at High p_T Processes

Tuesday, 7 August 2018 17:45 (25 minutes)

Presenter: SHIMANSKIY, Stepan (JINR, Dubna)

Session Classification: Tuesday Evening

Contribution ID: 87

Type: **not specified**

Classical solution for reggeized gluons and one loop corrections to Lipatov's effective action

Wednesday, 8 August 2018 18:00 (20 minutes)

Presenter: POZDNYAKOV, Semyon (Saint Petersburg State University)

Session Classification: Wednesday Evening

Contribution ID: **88**

Type: **not specified**

Symanzik approach in modeling the interaction of quantum fields with extended objects: scattering of Dirac particles on material plane.

Friday, 10 August 2018 10:30 (20 minutes)

Presenter: PISMAK, Yuri

Session Classification: Friday Morning

Contribution ID: 89

Type: **not specified**

The semi-phenomenological effective Hamiltonian of QCD on the light front

Friday, 10 August 2018 10:50 (20 minutes)

A semiphenomenological variant of the construction of the QCD Hamiltonian on the light front in the light front gauge is considered. This Hamiltonian is intended to describe the hadronic states constructed from "effective" quarks and gluons on the light front. Such Hamiltonian provides confinement for the quark-antiquark state both in the transverse direction and in the longitudinal (light-like) direction.

Presenter: MALYSHEV, Mikhail (Saint Petersburg State University)

Session Classification: Friday Morning

Contribution ID: **90**

Type: **not specified**

Few-nucleon systems in the Bethe-Salpeter approach

Friday, 10 August 2018 11:10 (20 minutes)

Presenter: BONDARENKO, Serge (Joint Institute for Nuclear Research (RU))

Session Classification: Friday Morning

Contribution ID: **91**

Type: **not specified**

SUSY-like relation in evolution of gluon and quark jet multiplicities

Friday, 10 August 2018 12:30 (20 minutes)

Presenter: KOTIKOV, Anatoly (JINR, Dubna)

Session Classification: Friday Morning

Contribution ID: 92

Type: **not specified**

Reggeon integrands in N=4 SYM

Friday, 10 August 2018 12:50 (20 minutes)

In this talk we are going to discuss all-loop conjecture for integrands of reggeon amplitudes in N=4 SYM. In particular we will present a new gluing operation in momentum twistor space used to obtain reggeon tree-level amplitudes and loop integrands from corresponding expressions for on-shell amplitudes. The introduced gluing procedure is used to derive BCFW recursions both for tree-level reggeon amplitudes and their loop integrands. In addition we provide predictions for reggeon loop integrands written in the basis of local integrals. As a check of the correctness of gluing operation at loop level we derive the expression for LO BFKL kernel in N=4 SYM.

Presenter: ONISHCHENKO, Andrei**Session Classification:** Friday Morning

Contribution ID: 93

Type: **not specified**

Conventional nuclear forces as a consequence of the quark-gluonic hadronization into mesons

Presenter: GONCHAROV, Yuri (SPbPU)

Session Classification: Thursday Evening

Contribution ID: 94

Type: **not specified**

Effects of hard multi-parton interactions in the heavy flavor sector at the LHC

Presenter: MACIULA, Rafal (Institute of Nuclear Physics PAN)

Session Classification: Tuesday Evening

Contribution ID: 95

Type: **not specified**

DIS at small x and hadron-hadron scattering at high energies via the holographic Pomeron exchange

Wednesday, 8 August 2018 17:10 (25 minutes)

Presenter: WATANABE, Akira

Session Classification: Wednesday Evening

Contribution ID: 96

Type: **not specified**

Holographic anisotropic QCD

Wednesday, 8 August 2018 16:20 (25 minutes)

Presenter: AREFEVA, Irina (MI RAS, Moscow)

Session Classification: Wednesday Evening