

Workshop on Resummation, Evolution, Factorization (REF 2019)

Report of Contributions

Contribution ID: 6

Type: **not specified**

Heavy-quark production with kt-factorization: The importance of the sea-quark distribution

Tuesday, November 26, 2019 3:00 PM (20 minutes)

Heavy-quark production is of first importance at the LHC, allowing to test factorization formulas, and to probe cold and hot nuclear matter. In the first part of the presentation, I will quickly review heavy-quark production in the case of the collinear factorization, making some useful remarks for the second part of the talk. Then, I will switch to heavy-quark production with kt-factorization. The main goal is to discuss the fact that present calculations take into account only the gluon-gluon contribution. I will show that, in fact, in the case of a variable-flavor-number scheme (commonly used at the LHC), the main contribution is given by the $Qg \rightarrow Qg$ contribution. The most interesting part is the answer to the following question: Why current studies are in agreement with data if they neglect the main contribution? We will see that the answer is not unique. (This work has been published in PRD 99, 074006).

Primary author: GUIOT, Benjamin (Universidad federico santa maria)

Presenter: GUIOT, Benjamin (Universidad federico santa maria)

Session Classification: Tuesday 3

Contribution ID: 10

Type: **not specified**

An EFT approach to quarkonium at small transverse momentum

Tuesday, November 26, 2019 10:30 AM (20 minutes)

In this work we apply effective field theory (EFT) to observables in quarkonium production and decay that are sensitive to soft gluon radiation, in particular measurement that are sensitive to small transverse momentum. Within the EFT framework we study χ_Q decay to light quarks followed by the fragmentation of those quarks to light hadrons and derive a factorization theorem that involves the un-subtracted transverse momentum distributions (TMDs) and quarkonium TMD shape functions. We derive renormalization group equations, both in rapidity and virtuality, which are used to evolve the different terms in the factorization theorem and resum large logarithms. This theoretical framework will provide a systematic treatment of quarkonium production and decay processes in TMD sensitive measurements

Primary author: MAKRIS, Yiannis

Presenter: MAKRIS, Yiannis

Session Classification: Tuesday 1

Contribution ID: 11

Type: **not specified**

Parton shower based on TMD parton distributions

Monday, November 25, 2019 5:40 PM (20 minutes)

We present a parton shower based on Transverse Momentum Dependent (TMD) parton distributions obtained with the Parton Branching method. We investigate how well the TMD parton shower reproduces the TMD parton distributions. Applications of the TMD parton shower to LHC processes will be presented.

Primary authors: SCHMITZ, Melanie (DESY); JUNG, Hannes (DESY); TAHERI MONFARED, Sara (DESY); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country)

Presenter: SCHMITZ, Melanie (DESY)

Session Classification: Monday 2

Contribution ID: 13

Type: **not specified**

Z boson production in proton-lead collisions at the LHC accounting for transverse momenta of initial partons

Tuesday, November 26, 2019 3:30 PM (20 minutes)

We perform a calculation of inclusive Z boson production in proton-lead collisions at the LHC taking into account the transverse momenta of the initial partons. We use the framework of k_T -factorization combining transverse momentum dependent parton distributions (TMDs) with off-shell matrix elements. In order to do it we need to construct appropriate TMDs for lead nuclei which is done using the parton branching method. Our computations are compared with data from CMS taken at $\sqrt{s} = 5.02$ TeV. The results are in good agreement with the measurements especially the transverse momentum distribution of the Z boson.

Primary authors: BLANCO, Etienne (IFJ PAN); Dr VAN HAMEREN, Andreas (IFJ PAN); JUNG, Hannes (DESY); KUTAK, Krzysztof (IFJ PAN); Dr KUSINA, Aleksander (IFJ PAN)

Presenter: BLANCO, Etienne (IFJ PAN)

Session Classification: Tuesday 3

Contribution ID: 17

Type: **not specified**

PB TMD distributions from fits to DIS precision data

Wednesday, November 27, 2019 2:30 PM (20 minutes)

We present a new determination of Transverse Momentum Dependent (TMD) parton distributions applying the Parton Branching method. The PB TMDs are obtained from fits to precision DIS data using DGLAP splitting functions at leading and higher order. In addition the CCFM splitting function will be applied to include small x effects. Applications of these new TMD distributions will be discussed.

Primary authors: TAHERI MONFARED, Sara (DESY); JUNG, Hannes (DESY); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country); SCHMITZ, Melanie (DESY)

Presenter: TAHERI MONFARED, Sara (DESY)

Session Classification: Wednesday 3

Contribution ID: 18

Type: **not specified**

Dijet azimuthal correlations in multijet production at high energy in k_T -factorization

Tuesday, November 26, 2019 12:30 PM (20 minutes)

A new method of consistent merging of jet calculations in k_T -factorization with higher-order matrix elements is proposed. We study azimuthal correlations between leading and subleading jets in large- p_T multijet production with two, three and four jets in final state within the parton Reggeization approach (PRA). PRA is based on k_T -factorization of hard processes in the multi-Regge

kinematics, Kimber-Martin-Ryskin unPDFs and Lipatov's effective theory of Reggeized gluons and quarks. Last one allows to treat initial-state radiation in a gauge invariant way. As it was shown earlier in [1] and [2], Reggeized amplitudes in PRA totally agree with off-shell amplitudes from the AVHLIB [3] and calculations of hard cross sections use MC generator KaTie [4] with KMR unPDFS [5] should coincide with direct calculations in PRA. We have checked this statement for production of two and three jets. The final calculations have been done with KaTie MC event generator. We have obtained a good agreement with CMS data [6] for azimuthal correlations between leading and subleading jets for events with more than two, three and four jets.

[1] A.V.Karpishkov, M.A.Nefedov and V.A.Saleev,
 $B\bar{B}$ angular correlations at the LHC in parton Reggeization approach merged with higher-order matrix elements,
Phys. Rev. D **96** (2017) no.9, 096019.

[2] K.Kutak, R.Maciula, M.Serino, A.Szczurek and A.van Hameren,
Four-jet production in single- and double-parton scattering within high-energy factorization,
JHEP **1604** (2016) 175.

[3] M. Bury, A. van Hameren, Numerical evaluation of multi-gluon amplitudes for High Energy Factorization, Comput. Phys. Commun. **196** (2015) 592.

[4] A. van Hameren, KaTie: For parton-level event generation with k_T -dependent initial states Published in Comput.Phys.Commun. **224** (2018) 371-380

[5] M. A. Kimber, A. D. Martin, and M. G. Ryskin, Unintegrated parton distributions and prompt photon hadroproduction, Eur. Phys. J. **C12** (2000) 655.

[6] A.M. Sirunyan, A. Tumasyan, W. Adam, et al., Azimuthal correlations for inclusive 2-jet, 3-jet, and 4-jet events in pp collisions at $\sqrt{S} = 13$ TeV, Eur. Phys. J. **C78** (2018) 566.

Primary author: SALEEV, Vladimir (Samara National Research University)

Co-author: NEFEDOV, Maxim

Presenter: SALEEV, Vladimir (Samara National Research University)

Session Classification: Tuesday 2

Contribution ID: 19

Type: **not specified**

Resummation in Heavy Quarkonium Production

Tuesday, November 26, 2019 10:00 AM (20 minutes)

We discuss resummation of large logarithms in heavy quarkonium production cross sections. Due to the nonrelativistic nature of heavy quarkonium states, nonperturbative matrix elements of heavy quarkonia can involve singular distributions. In such cases, standard methods of solving evolution equations can lead to nonconverging integrals or series. We discuss methods to overcome these difficulties and obtain resummed cross sections in heavy quarkonium inclusive and exclusive production processes.

Primary author: CHUNG, Hee Sok (Technical University of Munich)

Presenter: CHUNG, Hee Sok (Technical University of Munich)

Session Classification: Tuesday 1

Contribution ID: 20

Type: **not specified**

Wilson-line geometries and the relation between IR singularities of form factors and the large-x limit of DGLAP splitting functions

Friday, November 29, 2019 10:30 AM (20 minutes)

We discuss the relation between the infrared singularities of on-shell partonic form factors and parton distribution functions (PDFs) near the elastic limit, through their factorisation in terms of Wilson-line correlators. Ultimately we identify the difference between the anomalous dimension controlling single poles of these two quantities to all loops in terms of the closed parallelogram Wilson loop. To arrive at this result we first use the common hard-collinear behaviour of the two to derive a relation between their respective non-collinear soft singularities, and then show that the latter is manifested in terms of differing Wilson-line geometries. We use explicit diagrammatic calculations in configuration space through two loops to verify the relation. More generally, the emerging picture allows us to classify collinear singularities in eikonal quantities depending on whether they are associated with finite (closed) Wilson-line segments or infinite (open) ones.

Primary authors: MILLOY, Calum (University of Edinburgh); GARDI, Einar (University of Edinburgh); FALCIONI, Giulio

Presenter: MILLOY, Calum (University of Edinburgh)

Session Classification: Friday 1

Contribution ID: 21

Type: **not specified**

Using Jets for TMD search

Thursday, November 28, 2019 12:00 PM (20 minutes)

Jet technics have been used and developed for a while at LHC. I will discuss the compatibility of jet definition with the TMD factorization theorem and how they can be used in TMD investigations.

Primary author: SCIMEMI, Ignazio (Universidad Complutense Madrid)

Presenter: SCIMEMI, Ignazio (Universidad Complutense Madrid)

Session Classification: Thursday 2

Contribution ID: 22

Type: **not specified**

The High-Energy Limit of 2 to 2 Partonic Scattering Amplitudes

Thursday, November 28, 2019 5:00 PM (20 minutes)

Recently, there has been significant progress in computing scattering amplitudes in the high-energy limit using rapidity evolution equations. I describe the state-of-the-art and demonstrate the interplay between exponentiation of high-energy logarithms and that of infrared singularities. The focus in this talk is the imaginary part of 2 to 2 partonic amplitudes, which can be determined by solving the BFKL equation. I demonstrate that the wavefunction is infrared finite, and that its evolution closes in the soft approximation. Within this approximation I derive a closed-form solution for the amplitude in dimensional regularization, which fixes the soft anomalous dimension to all orders at NLL accuracy.

I then turn to finite contributions of the amplitude and show that the remaining ‘hard’ contributions can be determined algorithmically, by iteratively solving the BFKL equation in exactly two dimensions within the class of single-valued harmonic polylogarithms.

To conclude I present numerical results and analyse large-order behaviour of the amplitude.

Primary authors: Prof. GARDI, Einan (University of Edinburgh); Dr REICHEL, Joscha (University of Edinburgh); Prof. CARON-HUOT, Simon (McGill University); Dr VERNAZZA, Leonardo (Nikhef)

Presenter: Prof. GARDI, Einan (University of Edinburgh)

Session Classification: Thursday 4

Contribution ID: 23

Type: **not specified**

Small-x resummation and its impact in PDF determination

Friday, November 29, 2019 9:30 AM (20 minutes)

I will consider the resummation of logarithms of the momentum scaling variable x , which become large at small momentum fractions, namely at high energies. I will cover recent developments in the field, which led to the first PDF fits including small- x resummation. I will discuss the effects on PDF determination, and the implications for present and future collider phenomenology.

Primary author: BONVINI, Marco (ROMA1)

Presenter: BONVINI, Marco (ROMA1)

Session Classification: Friday 1

Contribution ID: 26

Type: **not specified**

Shockwaves, TMD distributions and BFKL

Thursday, November 28, 2019 5:30 PM (20 minutes)

I will discuss the continuity between small x physics and moderate x physics by showing how semiclassical descriptions of small x amplitudes can be fully rewritten in terms of TMD distributions.

With this equivalence in mind, I will reinterpret saturation models in terms of these distributions.

Primary authors: ALTINOLUK, Tolga (NCBJ Warsaw); KOTKO, Piotr (AGH); BOUSSARIE, Renaud (Brookhaven National Lab)

Presenter: BOUSSARIE, Renaud (Brookhaven National Lab)

Session Classification: Thursday 4

Contribution ID: 27

Type: **not specified**

Phenomenology of Sudakov Resummation in the CGC Framework

Thursday, November 28, 2019 3:00 PM (20 minutes)

We calculate and compare the differential cross sections for forward Z^0 -boson production at small transverse momentum, in proton-proton and proton-nucleus collisions, using both the collinear and dilute-dense factorization frameworks. In both cases, we implement a Sudakov resummation of the large logarithms generated by soft-gluon emissions, which is essential in order to describe the transverse momentum distribution of forward Z^0 bosons measured at the Tevatron and the LHC. We further compute the nuclear modification factor in the dilute-dense framework, hoping to single out signals of saturation effects at small values of x . Our predictions are compared with those obtained in the collinear factorization framework, using two different nuclear parton distribution functions.

arXiv:1909.08572

Primary author: WEI, Shu-yi (ECT*)

Presenter: WEI, Shu-yi (ECT*)

Session Classification: Thursday 3

Contribution ID: 30

Type: **not specified**

Matching NLO with Paton Branching TMD's on inclusive Z and $b\bar{b}$ production

Monday, November 25, 2019 5:10 PM (20 minutes)

We present NLO predictions from Powheg (POWHEG_BOX_V2) and MC@NLO merged with Paton Branching TMD's for inclusive Z and $b\bar{b}$ production. We compare predictions for range of mass $60 < M_Z < 120$ and $60 < M_{b\bar{b}} < 120$ (around Z mass) in order to study soft gluon radiation and resummation from quarks and gluons.

Primary authors: Mr ESTEVEZ BANOS, Luis Ignacio (DESY); Dr JUNG, Hannes (DESY); Dr CONNOR, Patrick (DESY); Dr BERMUDEZ MARTINEZ, Armando (DESY); Dr ZLEBICKI, Raddek (DESY)

Presenter: Mr ESTEVEZ BANOS, Luis Ignacio (DESY)

Session Classification: Monday 2

Contribution ID: 31

Type: **not specified**

Photoproduction of three jets in TMD factorization from the CGC

Thursday, November 28, 2019 2:30 PM (20 minutes)

In this work, we investigate the photoproduction of three jets at low- x . We calculate the cross section using the Color Glass Condensate (CGC) effective theory, allowing us to resum the multiple scattering of the hard partons off the dense semi-classical gluon fields in the highly boosted proton or nucleus. In the so-called correlation limit, in which the sum q_T of the transverse momenta of the jets is smaller than each of the individual momenta K_T , the result can be expanded in the small parameter q_T/K_T and one recovers a (leading-order) TMD factorized expression. This expression consists of the same hard parts one would obtain in a TMD calculation, convolved with what we show are the unpolarized and linearly polarized Weizsäcker-Williams gluon TMDs. We show model predictions for the cross section, ways to disentangle the TMDs with the help of azimuthal momenta, and elaborate on the future outlook.

Primary authors: TAEELS, Pieter Maria (Istituto Nazionale di Fisica Nucleare); ALTINOLUK, Tolga (NCBJ Warsaw); MARQUET, Cyrille (University of Santiago de Compostela); BOUSSARIE, Renaud (Brookhaven National Lab)

Presenter: TAEELS, Pieter Maria (Istituto Nazionale di Fisica Nucleare)

Session Classification: Thursday 3

Contribution ID: 32

Type: **not specified**

Production of Z-boson in parton branching method

Monday, November 25, 2019 3:10 PM (20 minutes)

Transverse Momentum Dependent (TMD) parton distributions obtained from the Parton Branching (PB) method are combined with next-to-leading-order (NLO) calculations of Drell-Yan (DY) production. MC@NLO method is used for the hard process calculation and match with the PB TMDs. The predictions of the transverse momentum, rapidity and ϕ^* spectra of Z boson have been computed. The theoretical predictions agree well with measurements at the Large Hadron Collider (LHC) within uncertainties. In particular, we study the region of lowest transverse momenta at the LHC, and comment on its sensitivity to nonperturbative TMD contributions.

Primary author: WANG, QUN (DESY - PKU)

Presenter: WANG, QUN (DESY - PKU)

Session Classification: Monday 1

Contribution ID: 33

Type: **not specified**

Diffractive leptonproduction of ρ and ϕ light vector mesons via small- x unintegrated gluon density

Tuesday, November 26, 2019 2:30 PM (20 minutes)

The unintegrated gluon distribution (UGD) provides the description of the gluon content in the proton in the high-energy regime and it is formulated in κ_T -factorization approach. In this theoretical framework, the helicity amplitude is a convolution of the UGD in the proton with the impact factor, which depends on the considered process and where the structure of the meson is encoded by distribution amplitude (DA).

We apply κ_T -factorization approach, exploiting two different UGD models, in order to give predictions for polarized cross sections σ_L and σ_T of two interesting channels: the leptonproduction of ρ and ϕ mesons. We compare results with H1 and ZEUS measurements.

Primary author: BOLOGNINO, Andr e Dafne (Universit  della Calabria & INFN-Cosenza)

Presenter: BOLOGNINO, Andr e Dafne (Universit  della Calabria & INFN-Cosenza)

Session Classification: Tuesday 3

Contribution ID: 34

Type: **not specified**

Multi-jet merging in the parton branching method

Monday, November 25, 2019 4:40 PM (20 minutes)

Transverse Momentum Dependent parton distributions obtained from the Parton Branching method are combined with leading-order calculations of Drell-Yan production with up to three partons in the final state. A modified version of the MLM merging algorithm is applied in order to remove double counting from the different jet multiplicities. The merging is tested using the differential jet rate plots and the merging uncertainty is estimated by varying the merging scale. Final predictions for the inclusive Z pt distribution are compared to the data as well as to the NLO calculations obtained with the MC@NLO method.

Primary authors: BERMUDEZ MARTINEZ, Armando (DESY); Dr JUNG, Hannes (DESY); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country)

Presenter: BERMUDEZ MARTINEZ, Armando (DESY)

Session Classification: Monday 2

Contribution ID: 35

Type: **not specified**

Dynamical resolution scale in transverse momentum distributions at the LHC

Monday, November 25, 2019 3:40 PM (20 minutes)

The QCD evolution of transverse momentum dependent (TMD) distribution functions has recently been formulated in a parton branching (PB) formalism. In this approach, soft-gluon coherence effects are taken into account by introducing the soft-gluon resolution scale and exploiting the relation between transverse-momentum recoils and branching scales. In this talk we investigate the implications of dynamical, i.e., branching scale dependent, resolution scales.

We present both analytical studies and numerical solution of PB evolution equations in the presence of dynamical resolution scales.

We use this to compare PB results with other approaches in the literature, and to analyze predictions for transverse momentum distributions in Z -boson production at the Large Hadron Collider (LHC).

Primary author: VAN KAMPEN, Mees (Universiteit Antwerpen)

Co-authors: LELEK, Aleksandra (UAntwerp); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country); KEERSMAEKERS, Lissa (University of Antwerp)

Presenter: VAN KAMPEN, Mees (Universiteit Antwerpen)

Session Classification: Monday 1

Contribution ID: 36

Type: **not specified**

TMDs and DPDs on the lattice

Thursday, November 28, 2019 9:30 AM (20 minutes)

While the investigation of TMDs is a major objective of the EIC, Double Parton Distributions (DPDs) are crucial for a first principle QCD description of double parton interactions at LHC, which contribute to the standard model background for various BSM searches. Both groups of functions are genuinely non-collinear and non-perturbative. The non-collinearity required the development of new concepts, most notably the introduction of soft factors. The soft factors for TMDs and DPDs turned out to be related. Lattice calculations are expected and actually needed to supplement the experimental efforts, e.g. at EIC and LHC but are significantly more difficult than for, e.g. PDFs. The talk will review the present status.

Primary author: SCHAFER, Andreas (Regensburg University)

Presenter: SCHAFER, Andreas (Regensburg University)

Session Classification: Thursday 1

Contribution ID: 37

Type: **not specified**

BFKL resummation in heavy-quark pair hadroproduction

Thursday, November 28, 2019 3:30 PM (20 minutes)

We consider the inclusive production in proton-proton collisions of two heavy quarks, separated by a large rapidity interval, that can be experimentally investigated at the Large Hadron Collider (LHC) to test QCD predictions in the semi-hard regime. The process is studied in the Regge kinematical region by the Balitsky-Fadin-Kuraev-Lipatov (BFKL) approach. A full resummation of leading energy logarithms and a partial resummation of the next-to-leading ones are performed. Predictions for the cross section summed over the azimuthal angles and for azimuthal correlations are presented.

Primary authors: FUCILLA, Michael (Università della Calabria); PAPA, Alessandro (CS); IVANOV, Dmitry (Sobolev Institute of Mathematics); BOLOGNINO, Andr e Dafne (CS); CELIBERTO, Francesco Giovanni (PV)

Presenter: FUCILLA, Michael (Università della Calabria)

Session Classification: Thursday 3

Contribution ID: 38

Type: **not specified**

The impact of the non-perturbative parameters in the PB method on the predictions for low energy DY measurements

Wednesday, November 27, 2019 3:00 PM (20 minutes)

The PB TMDs were successfully used for obtaining predictions for LHC measurements. However, these measurements turned out to not be sensitive to some of the non-perturbative parameters existing in the PB approach. In this talk we show preliminary results for the application of PB TMDs to low energy DY data. We illustrate the role of non-perturbative dynamics, including intrinsic transverse momentum and soft-gluon resolution scale, in the PB TMDs, and we discuss their impact on phenomenological predictions.

Primary authors: LELEK, Aleksandra (UAntwerp); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country); KEERSMAEKERS, Lissa (University of Antwerp); VAN KAMPEN, Mees (Universiteit Antwerpen)

Presenter: LELEK, Aleksandra (UAntwerp)

Session Classification: Wednesday 3

Contribution ID: 39

Type: **not specified**

A model calculation of the transverse-momentum-dependent gluon density in the proton

Friday, November 29, 2019 10:00 AM (20 minutes)

While significant steps toward the formal definition of quark TMDs and their extraction from experimental data through global fits has been made in the last years, the gluon-TMD field represents a largely unexplored territory. Pursuing the goal of extending our knowledge of this sector, we present analytic expressions for all T -even gluon TMDs at twist-2, calculated in a spectator model for the parent nucleon. At variance with respect to previous works, our approach encodes a flexible parametrization for the spectator-mass spectral density, allowing us to improve the description in the small- x region.

We build a common framework where valence, sea quark and gluon densities are concurrently generated. Our results can be used to predict the behavior of observables sensitive to gluon-TMD dynamics.

Primary authors: BACCHETTA, Alessandro (PV); CELIBERTO, Francesco Giovanni (University of Pavia and INFN); RADICI, Marco (PV); TAEELS, Pieter Maria (Istituto Nazionale di Fisica Nucleare)

Presenter: CELIBERTO, Francesco Giovanni (University of Pavia and INFN)

Session Classification: Friday 1

Contribution ID: 40

Type: **not specified**

TMD splitting functions in kT-factorization and prospects for using them in the evaluation of TMD distribution functions

Monday, November 25, 2019 6:10 PM (20 minutes)

We present an overview of the calculation of transverse momentum dependent (TMD) real emission contributions to splitting functions within kT-factorization. We discuss their properties, such as the limits in which they reduce to well known kernels.

We present an implementation of the splitting functions in a Monte Carlo simulation, based on the Parton Branching method. Results of TMD distribution functions from this implementation are shown.

Primary authors: KEERSMAEKERS, Lissa (University of Antwerp); LELEK, Aleksandra (UAntwerp); KUTAK, Krzysztof (IFJ PAN); HENTSCHINSKI, Martin (BNL); Dr KUSINA, Aleksander (IFJ PAN); HAUTMANN, Francesco (University of Antwerp, University of Oxford, University of the Basque Country)

Presenter: KEERSMAEKERS, Lissa (University of Antwerp)

Session Classification: Monday 2

Contribution ID: 41

Type: **not specified**

Prompt hadroproduction of pseudoscalar charmonia in the k_T factorization approach

Tuesday, November 26, 2019 11:30 AM (20 minutes)

We present our recent calculations on the production of pseudoscalar charmonia $\eta_c(1S)$ and $\eta_c(2S)$ in the k_T factorization approach. We discuss the regions of longitudinal and transverse momenta of gluons probed in the kinematics of the LHCb or ATLAS experiments.

The crucial ingredient is the off-shell matrix element, which in this case is related to a $g^* g^* \eta_c$ form factor. Its calculation proceeds analogously to the $\gamma^* \gamma^* \eta_c$ form factor obtained in terms of the light front wave function of the charmonium in [1].

We compare our results to recent LHCb data and discuss the sensitivity to the choice of the unintegrated gluon distribution.

[1] I.~Babiarz, V.~P.~Goncalves, R.~Pasechnik, W.~Schäfer and A.~Szczyrak, Phys. Rev. D 100 (2019) no.5, 054018

Primary author: SCHAEFER, Wolfgang (Institute of Nuclear Physics PAN)

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

Session Classification: Tuesday 2

Contribution ID: 42

Type: **not specified**

Single-spin asymmetries in $p^\uparrow p \rightarrow J/\psi$ collision within a TMD approach

Tuesday, November 26, 2019 9:30 AM (20 minutes)

Quarkonium production has been advertised as a tool to probe the gluon TMDs. Among the eight gluon TMDs, gluon Sivers function has been receiving paramount of interest both theoretically and experimentally. We study the single-spin asymmetry (SSA) in proton-proton collision process in J/ψ production by employing the generalized parton model (GPM), and compare SSA with PHENIX data. We discuss how the singularities coming from color octet states can be cured in a simple way, which leads to finite cross section in the low- p_T region.

Primary author: SANGEM, Rajesh (Istituto Nazionale di Fisica Nucleare)

Co-authors: D'ALESIO, Umberto (CA); MURGIA, Francesco (CA); PISANO, Cristian (CA)

Presenter: SANGEM, Rajesh (Istituto Nazionale di Fisica Nucleare)

Session Classification: Tuesday 1

Contribution ID: 43

Type: **not specified**

Azimuthal asymmetries in SIDIS and Drell-Yan processes: from high to low transverse momentum

Thursday, November 28, 2019 9:00 AM (20 minutes)

We consider the azimuthal distribution of the final observed hadron in semi-inclusive deep-inelastic scattering and the lepton pair in the Drell-Yan process. In particular, we focus on the $\cos\phi$ modulation of the unpolarized cross section and on its dependence upon transverse momentum. At low transverse momentum, for these observables we propose a factorized expression based on tree-level approach and conjecture that the same formula is valid in transverse-momentum dependent (TMD) factorization when written in terms of subtracted TMD parton distributions. Our formula correctly matches with the collinear factorization results at high transverse momentum, solves a long-standing problem and is a necessary step towards the extension of the TMD factorization theorems up to the subleading twist.

Primary author: PISANO, Cristian (CA)

Presenter: PISANO, Cristian (CA)

Session Classification: Thursday 1

Contribution ID: 44

Type: **not specified**

Combining QED and QCD transverse-momentum resummation for vector boson production at hadron colliders

Wednesday, November 27, 2019 9:30 AM (20 minutes)

We consider the transverse-momentum (q_T) distribution of Z bosons produced in hadronic collisions. At small values of q_T , we perform the analytic resummation of the logarithmically enhanced QED contributions up to next-to-leading logarithmic accuracy, including the mixed QCD-QED contributions at leading logarithmic accuracy. Resummed results are consistently matched with the next-to-leading fixed-order results at small, intermediate and large values of q_T and combined the known QCD results. We show numerical results at LHC and Tevatron energies, studying the impact of the QED corrections and providing an estimate of the corresponding perturbative uncertainty. We show preliminary results about the extension of our analytic results, valid for the production of generic neutral and colourless high-mass systems in hadronic collision, to the case of charged W boson production.

Primary author: FERRERA, Giancarlo (MI)

Co-authors: Dr CIERI, Leandro Javier (Istituto Nazionale di Fisica Nucleare - Sez. Milano Bicocca); SBORLINI, German Fabricio Roberto (M)

Presenter: FERRERA, Giancarlo (MI)

Session Classification: Wednesday 1

Contribution ID: 45

Type: **not specified**

Helicity-dependent generalization of the JIMWLK evolution

Friday, November 29, 2019 11:00 AM (20 minutes)

The small- x evolution equations for the quark and gluon helicity distribution have recently been constructed by finding sub-eikonal corrections to the eikonal shock wave formalism. Those equations are written for correlators of infinite light-cone Wilson lines along with the so-called polarized Wilson lines. Those equations close in the large N_c -limit (N_c is the number of quark colors), but also in the large N_c & N_f -limit (N_f is the number of quark flavors). However, in the shock wave formalism, no closed form can be obtained for arbitrary value of N_c and N_f .

For the unpolarized case, the generalization of the Balitsky-Kovchegov equation is done by the Jalilian-Marian—Iancu—McLerran—Weigert—Leonidov—Kovner (JIMWLK) functional evolution equation. Such an approach for the small- x evolution of the helicity is beneficial for numerical evaluation at finite N_c and N_f (beyond previously used limit), and for the evaluation of helicity-dependent operator with an arbitrary number of Wilson lines. We derive an analogue of the JIMWLK evolution equation for the small- x evolution of helicity distributions and obtain an evolution equation for the target weight functional.

Primary authors: COUGOULIC, Florian (The Ohio State University); KOVCHEGOV, Yuri (The Ohio State University)

Presenter: COUGOULIC, Florian (The Ohio State University)

Session Classification: Friday 1

Contribution ID: 46

Type: **not specified**

Joint Higgs and jet transverse-momentum resummation in direct space

Wednesday, November 27, 2019 12:00 PM (20 minutes)

I present recent developments in the direct-space resummation of transverse observables in colour-singlet production in the RadISH framework, with particular focus on the NNLL joint resummation for the transverse momentum of the Higgs boson and of the leading jet in gluon fusion at the LHC.

Primary author: TORRIELLI, Paolo (Istituto Nazionale di Fisica Nucleare)

Presenter: TORRIELLI, Paolo (Istituto Nazionale di Fisica Nucleare)

Session Classification: Wednesday 2

Contribution ID: 47

Type: **not specified**

NNLL resummations with ARES

Wednesday, November 27, 2019 11:30 AM (20 minutes)

I present the ARES method for the resummation of final-state observables at NNLL accuracy. I discuss the main feature of the method, and the most important results obtained with it. I will then present its most recent developments.

Primary author: BANFI, Andrea (University of Sussex)

Presenter: BANFI, Andrea (University of Sussex)

Session Classification: Wednesday 2

Contribution ID: 49

Type: **not specified**

CANCELLED Hadron Production in High-Energy Particle Collisions

Based on the quark-hadron duality concept the hadronization of the deconfined matter arising in high-energy particle collisions is considered. The number of generated hadrons is shown to be entirely determined by the exact non-equilibrium Green's functions of partons in the deconfined matter and the vertex function governed by the probability of the confinement-deconfinement phase transition.

Compactifying the standard (3+1) chromodynamics into $QCD_{xy} + QCD_{zt}$, the rate of hadrons produced in particle collisions with respect to both the rapidity and p_T distributions is derived in the flux tube approach. Provided that the hadronization is the first order phase transition, the hadron rate is derived in the explicit form. The obtained rate is found to depend strongly on the energy of the colliding particles, number of tubes, hadron mass as well as on the temperature of the confinement-deconfinement phase transition. In the case of the pion production in pp collisions we obtain a good agreement to the experimental results on the pion yield with respect to both the rapidity and p_T distributions.

Primary author: Prof. KOSHELKIN, Andrew

Presenter: Prof. KOSHELKIN, Andrew

Session Classification: Friday 2

Contribution ID: **50**

Type: **not specified**

TMDlib and TMDplotter

TMDlib is a repository of existing TMD parton distributions, and TMDplotter is a tool to plot and compare them. I will discuss recent progress and describe the features of the new TMDlib 2.0 version.

Primary author: JUNG, Hannes (DESY)

Presenter: JUNG, Hannes (DESY)

Contribution ID: 51

Type: **not specified**

New developments in the PROSA PDF fit

Friday, November 29, 2019 9:00 AM (20 minutes)

The PROSA PDF fit was the first in the literature showing the impact of the inclusion of open-heavy flavour production data on low- x gluons.

We present a new version of the fit, including a more extended set of experimental data than our previous fit, which allows to better constrain gluon and sea quark distributions and we show its performances in applications of interest for neutrino astronomy.

Primary authors: PROSA COLLABORATION; ZENAIEV, Oleksandr (CERN); GARZELLI, Maria Vittoria (Universita' degli Studi di Firenze & Tuebingen Universitaet); GEISER, Achim (DESY, Hamburg); LIPKA, Katerina (DESY, Hamburg); MOCH, Sven-Olaf (Hamburg Universitaet)

Presenter: GARZELLI, Maria Vittoria (Universita' degli Studi di Firenze & Tuebingen Universitaet)

Session Classification: Friday 1

Contribution ID: 52

Type: **not specified**

Building maps of kinematical regions in SIDIS

Wednesday, November 27, 2019 3:30 PM (20 minutes)

In a SIDIS process, in order to establish the consistency of a particular hadronic observable with an estimate of the appropriate underlying partonic picture, one can introduce some quantitative criteria expressed in terms of various ratios of partonic and hadronic momentum degrees of freedom. I will describe how to use these criteria in phenomenology and provide a visualization of these ratios for some typical kinematic configurations.

Primary author: BOGLIONE, Mariaelena (TO)

Presenter: BOGLIONE, Mariaelena (TO)

Session Classification: Wednesday 3

Contribution ID: 53

Type: **not specified**

. Double parton distribution of valence quarks in the pion in chiral quark models

Tuesday, November 26, 2019 5:00 PM (20 minutes)

The valence double parton distribution of the pion is analyzed in the framework of chiral quark models, where in the chiral limit factorization between the longitudinal and transverse degrees of freedom occurs. This feature leads, at the quark-model scale, to a particularly simple distribution of the form $D(x_1, x_2,$

$$D(x_1, x_2, \vec{y}) = \delta(1 - x_1 - x_2) F(\vec{y})$$

where $x_{1,2}$ are the longitudinal momentum fractions carried by the valence quark and antiquark, and

\vec{y} is the separation of their transverse positions. For

$$D(x_1, x_2, \vec{y}) =$$

this result complies immediately to the Gaunt-Sterling sum rules. The DGLAP evolution to higher scales is carried out in terms of the Mellin moments. We then explore its role on the longitudinal correlation quantified with the ratio of the double distribution to the product of single distributions, $D(x_1, x_2,$

$\vec{y}) / D(x_1)D(x_2)$. We point out that the ratios of moments $\langle x_1^n x_2^m \rangle / \langle x_1^n \rangle \langle x_2^m \rangle$ are independent of the evolution, providing particularly suitable measures to be tested in the upcoming lattice simulations. The transverse form factor $F(\vec{y})$

is obtained in variants of the Nambu–Jona-Lasinio model with the spectral and Pauli-Villars regularizations. Interestingly, with the spectral regularization of the model, the effective cross section for the double parton scattering of pions is exactly equal to the geometric cross section,

$$\sigma_{\text{eff}} = \pi \langle$$

$\vec{y}^2 \rangle$ and yields about 20-mb.

Primary authors: Prof. BRONIEWSKI, Wojciech (Institute of Physics, Jan Kochanowski University, 25-406 Kielce, Poland); Prof. ENRIQUE, Ruiz Arriola (Universidad de Granada, Spain)

Presenter: Prof. ENRIQUE, Ruiz Arriola (Universidad de Granada, Spain)

Session Classification: Tuesday 4

Contribution ID: 54

Type: **not specified**

The Electron-Ion Collider: A facility to bring the era of quantitative QCD to maturity

Monday, November 25, 2019 2:10 PM (20 minutes)

Due to confinement, much of the richness as well as the challenge of quantum chromodynamics lies in relating the partonic degrees of freedom in the fundamental field theory to the hadronic degrees of freedom that we can observe. Within the context of high-energy QCD, the ability to factorize short-distance, perturbatively calculable partonic scattering cross sections from long-distance functions describing hadron structure or formation, and the ability to evolve the long-distance functions measured at one scale in order to make predications at a different scale, have been critical phenomenological tools for several decades. In the 1990s and early 2000s the development of resummation techniques enabled quantitative treatment of a variety of multiscale observables. As an extremely versatile next-generation facility for the study of QCD, the Electron-Ion Collider promises to bring the era of quantitative QCD to maturity, prompting the community to push the limits of applicability of current theoretical ideas, and inspiring new ones. Prospects for various types of physics measurements at the EIC will be discussed.

Primary author: AIDALA, Christine (University of Michigan)

Presenter: AIDALA, Christine (University of Michigan)

Session Classification: Monday 1

Contribution ID: 55

Type: **not specified**

Different forms of the kinematical constraint in BFKL

Thursday, November 28, 2019 4:30 PM (20 minutes)

We perform a detailed analysis of the different forms of the kinematical constraint imposed on the low x evolution. We find that all of them generate the same leading anti-collinear poles in Mellin space which agree with BFKL up to NLL order and up to NNLL in $N=4$ sYM. The coefficients of subleading poles vanish up to NNLL order for all constraints and we prove that this property should be satisfied to all orders. We then demonstrate that the kinematical constraints differ at further subleading orders of poles. We quantify the differences between the different forms of the constraints by performing numerical analysis both in Mellin space and in momentum space.

Primary authors: DEAK, Michal (Department of Physics, Pennsylvania State University); KUTAK, Krzysztof (IFJ PAN); Dr STASTO, Anna (Department of Physics, Pennsylvania State University); Mr LI, Wanchen (Department of Physics, Pennsylvania State University)

Presenter: DEAK, Michal (Department of Physics, Pennsylvania State University)

Session Classification: Thursday 4

Contribution ID: 56

Type: **not specified**

Quasi-TMDPDFs and the Collins-Soper Kernel

Thursday, November 28, 2019 10:00 AM (20 minutes)

In this talk I will discuss the concept of quasi-TMDPDFs, which are transverse momentum dependent parton distribution functions defined with operators on a spatial (equal-time) slice. These distributions must be defined so that they have the same infrared physics as the standard TMDPDF, but can be directly calculated with Lattice QCD. As a nice application, I discuss our proposal for using lattice QCD to obtain non-perturbatively the Collins-Soper evolution kernel for the standard TMDPDF.

Primary author: Prof. STEWART, Iain (MIT)

Presenter: Prof. STEWART, Iain (MIT)

Session Classification: Thursday 1

Contribution ID: 57

Type: **not specified**

Factorisation tools for infrared subtraction beyond NLO

Wednesday, November 27, 2019 10:30 AM (20 minutes)

I will review some recent work on the infrared subtraction problem beyond NLO, focusing in particular on the general definition of local subtraction counterterms. The starting point is the infrared factorisation of virtual corrections to fixed-angle scattering amplitudes in massless gauge theories, which can be used to define local soft and collinear counterterms in terms of matrix elements of field operators and Wilson lines, to all orders in perturbation theory. Tracing the connection between factorisation and subtraction uncovers significant simplifications in the structure of counterterms, especially for nested singular regions, and we believe that it will be a crucial ingredient for the construction of minimal, stable, and efficient subtraction algorithms, at NNLO and beyond. I will also briefly discuss a detailed implementation at NNLO, where we have completed the relevant analytic integrations for any massless final state.

Primary author: MAGNEA, Lorenzo (TO)

Presenter: MAGNEA, Lorenzo (TO)

Session Classification: Wednesday 1

Contribution ID: 60

Type: **not specified**

Soft gluon resummation in associated production of top-antitop pair and a H, Z or W boson

Wednesday, November 27, 2019 12:30 PM (20 minutes)

Soft gluon resummation for associated t-tbar pair and a H, Z or W boson is performed up to the NNLL accuracy in QCD. The results are matched to the NLO QCD and calculations. The total hadroproduction cross sections at the LHC are obtained as well as selected kinematical distributions. It is shown that the resummation leads to higher theoretical precision. Results are compared to data from the LHC.

Primary authors: Prof. KULESZA, Anna (Munster University); SCHWARTLÄNDER, Daniel (Munster University); STEBEL, Tomasz (Jagiellonian University); Dr THEEUWES, Vincent (Gottingen University); MOTYKA, Leszek (Jagiellonian University)

Presenter: MOTYKA, Leszek (Jagiellonian University)

Session Classification: Wednesday 2

Contribution ID: 61

Type: **not specified**

Prospects for measurements of H/Z production cross section ratios using CMS Run II data

Wednesday, November 27, 2019 9:00 AM (20 minutes)

We present prospects for the direct measurement of ratios of differential cross sections for the production of Z and Higgs bosons in proton-proton collisions, using data taken by CMS during the LHC Run II. The aim of the measurement is to study soft and hard gluon emission in the initial state for Higgs and Z production mechanisms. Hence, we focus on variables known to be sensitive to the production mechanisms of heavy bosons: jet multiplicity, transverse momenta of the boson and leading jet, and momentum balance in the transverse plane. We use Monte-Carlo samples to study the feasibility of the measurement and estimate the expected precision.

Primary author: MOUREAUX, Louis (IIHE-ULB)

Presenter: MOUREAUX, Louis (IIHE-ULB)

Session Classification: Wednesday 1

Contribution ID: 62

Type: **not specified**

Conformal invariance of TMD rapidity evolution

Thursday, November 28, 2019 10:30 AM (20 minutes)

Abstract: The most known scheme to regulate the rapidity/UV divergences of the Transverse Momentum Distribution operators due to the infinite light-like gauge links is the Collins Soper Sterman formalism or the Soft Collinear Effective Theory formalism. An alternative choice is provided by the scheme used in the small- x physics. The corresponding evolution equations differ already at leading order. In view of the future Electron-Ion Collider accelerator, which will probe the TMDs at values of the Bjorken x in the region between small- x to $x \sim 1$, the different formalisms need to be reconciled. Conformal invariance may help us find a solution in this direction.

I will discuss the conformal properties of TMD operators and present the result of the conformal rapidity evolution of TMD operators in the Sudakov region.

Primary author: CHIRILLI, Giovanni Antonio (University of Regensburg)

Presenter: CHIRILLI, Giovanni Antonio (University of Regensburg)

Session Classification: Thursday 1

Contribution ID: 63

Type: **not specified**

Drell-Yan pair production with the CCFM-K evolution

Tuesday, November 26, 2019 4:30 PM (20 minutes)

Drell-Yan pair production using transverse momentum dependent parton distributions evolved with the Catani-Ciafaloni-Fiorani-Marchesini-Kwieciński (CCFM-K) equations in the single loop approximation will be discussed. Such equations are obtained assuming angular ordering of emitted partons (coherence) for $x \sim 1$ and transverse momentum ordering for $x \ll 1$. This evolution scheme also contains the Collins-Sterman-Soper (CSS) soft gluon resummation. Comparison with a broad class of data on the transverse momentum distribution of the DY pair will be presented.

Primary authors: GOLEC-BIERNAT, Krzysztof (Krzysztof Golec-Biernat); STEBEL, Tomasz (Jagiellonian University)

Presenter: GOLEC-BIERNAT, Krzysztof (Krzysztof Golec-Biernat)

Session Classification: Tuesday 4

Contribution ID: 64

Type: **not specified**

Extraction of TMDs from Drell-Yan data

Wednesday, November 27, 2019 4:30 PM (20 minutes)

We present an extraction of unpolarized transverse-momentum dependent (TMD) parton distribution functions (PDFs) based on a fit on data from Drell-Yan processes in different experiments and kinematic ranges, including in particular LHC experiments. The analysis is performed in the TMD factorization framework with perturbative accuracy up to next-to-next-to-next-to-leading-log (N^3LL), obtaining an improvement in the agreement with data.

Primary author: BISSOLOTTI, Chiara (University of Pavia and INFN)

Presenter: BISSOLOTTI, Chiara (University of Pavia and INFN)

Session Classification: Wednesday 4

Contribution ID: 65

Type: **not specified**

Quarkonium production measurements as a tool for TMD studies

Tuesday, November 26, 2019 9:00 AM (20 minutes)

An overview will be given of recent experimental results on quarkonium production at the LHC, both inclusive and in association with other particles, such as W, Z bosons or another quarkonium. The challenges of making such measurements will be highlighted, and possible applications for extracting gluon TMDs will be discussed.

Primary author: KARTVELISHVILI, Vato (Lancaster University)

Presenter: KARTVELISHVILI, Vato (Lancaster University)

Session Classification: Tuesday 1

Contribution ID: 66

Type: **not specified**

The qT-subtraction formalism at N3LO

Wednesday, November 27, 2019 10:00 AM (20 minutes)

In this talk we will show the necessary ingredients of a N3LO perturbative QCD calculation using the qT-subtraction prescription. We will show which are the partially known (or missing) coefficients at the third order in the strong coupling and how we can circumvent this problem using the total cross section at the same perturbative order. We will apply this formalism to the particular case of Higgs boson production in the large top-mass limit.

Primary author: CIERI, Leandro Javier (Istituto Nazionale di Fisica Nucleare - Sez. Milano Bicocca)

Presenter: CIERI, Leandro Javier (Istituto Nazionale di Fisica Nucleare - Sez. Milano Bicocca)

Session Classification: Wednesday 1

Contribution ID: 67

Type: **not specified**

Transversal momentum dependence and production of jets in p-p, p-A and A-A

Thursday, November 28, 2019 12:30 PM (20 minutes)

I am going to present recent results on the broadening phenomenon in p-p, p-A and A-A collisions. In p-p and p-A the broadening is described in terms of the ITMD factorization, accounting for Sudakov effects and saturation. In A-A it is due to soft multiple collisions of the jet traversing the QGP.

Primary author: KUTAK, Krzysztof (IFJ PAN)

Presenter: KUTAK, Krzysztof (IFJ PAN)

Session Classification: Thursday 2

Contribution ID: 68

Type: **not specified**

Parton Reggeization Approach: prompt-J/psi pair production at LHC and developments towards NLO

Tuesday, November 26, 2019 12:00 PM (20 minutes)

We present Parton Reggeization Approach –the gauge-invariant scheme of kT factorization based on Lipatov’s gauge-invariant EFT for Multi-Regge processes in QCD.

After review of LO formalism, our recent [1] calculation of inclusive differential distributions of pairs of prompt J/psi produced in pp-collisions at the LHC in the framework of LO PRA and NRQCD-factorization formalism will be presented. To improve description of data in the region of large invariant mass (large rapidity separation) of the pair we also study the effects of BFKL resummation on top of our fixed-order prediction.

In the second part of the talk, new developments towards NLO calculations in PRA will be presented, including techniques of loop calculations including rapidity divergences and several scales of virtuality [2].

[1] Phys. Rev. Lett. 123, 162002 (2019)

[2] Nucl.Phys. B946, 114715 (2019)

Primary author: NEFEDOV, Maxim (II Institute for theoretical Physics, Uni. Hamburg; Samara National Research University)

Presenter: NEFEDOV, Maxim (II Institute for theoretical Physics, Uni. Hamburg; Samara National Research University)

Session Classification: Tuesday 2

Contribution ID: 70

Type: **not specified**

Universality and universality-breaking effects in factorized e^+e^- hadroproduction cross sections

Thursday, November 28, 2019 11:30 AM (20 minutes)

Recent BELLE measurements provide the cross section for single hadron production from e^+e^- annihilations, differential in the hadron transverse momentum with respect to the thrust axis. Universality breaking effects due to process-dependent soft factors make it very difficult to relate this cross section to that corresponding to hadron-pair production in e^+e^- annihilations, where TMD fragmentation functions are defined through the so-called “square-root definition”.

I will examine this correspondence in the framework of CSS factorization and provide the sketch of a scheme that might allow to relate 1-jet to 2-jet e^+e^- cross sections, neatly separating soft and collinear non-perturbative effects from the terms which can be calculated using a perturbative approach.

Primary author: SIMONELLI, Andrea (Istituto Nazionale di Fisica Nucleare)

Presenter: SIMONELLI, Andrea (Istituto Nazionale di Fisica Nucleare)

Session Classification: Thursday 2

Contribution ID: 71

Type: **not specified**

Unpolarized TMD distributions and their evolution from DY and SIDIS

Wednesday, November 27, 2019 5:00 PM (20 minutes)

I present the analysis of the unpolarized SIDIS and Drell-Yan data within the TMD factorization approach and the extraction of unpolarized TMD distributions and non-perturbative TMD evolution kernel. The joined fit of SIDIS and DY leads to an accurate determination of the TMD evolution kernel. I also discuss the influence of collinear distributions on TMD physics and the interpretation of the non-perturbative part of evolution.

Primary author: VLADIMIROV, Alexey (Regensburg University)

Presenter: VLADIMIROV, Alexey (Regensburg University)

Session Classification: Wednesday 4

Contribution ID: 72

Type: **not specified**

Welcome

Monday, November 25, 2019 2:00 PM (10 minutes)

Presenter: ECHEVARRIA, Miguel (INFN Pavia)

Session Classification: Monday 1

Contribution ID: 73

Type: **not specified**

Discussion: EW WG report, etc

Wednesday, November 27, 2019 5:30 PM (45 minutes)

Presenters: Dr BOZZI, Giuseppe (PV); BERTONE, Valerio (Università degli studi di Pavia)

Session Classification: Wednesday 4

Contribution ID: 74

Type: **not specified**

Discussion

Thursday, November 28, 2019 6:00 PM (30 minutes)

Session Classification: Thursday 4

Contribution ID: 75

Type: **not specified**

(Discussion)

Session Classification: Friday 2

Contribution ID: 76

Type: **not specified**

Registration

Monday, November 25, 2019 1:30 PM (30 minutes)

Contribution ID: 77

Type: **not specified**

Discussion: MCs, TMDlib, TMDplotter, etc

Tuesday, November 26, 2019 5:30 PM (45 minutes)

Presenter: JUNG, Hannes (DESY)

Session Classification: Tuesday 4

Contribution ID: 78

Type: **not specified**

Status of General-Purpose Event Generators

Monday, November 25, 2019 2:40 PM (20 minutes)

In this talk, I will give an overview of General-Purpose Event Generators for High-Energy physics, and attempt to highlight their HL-LHC and EIC-relevant aspects, such as their hard physics modelling, QCD and electroweak resummation properties (and recent developments), as well as non-perturbative modelling relevant for TMD physics.

Primary author: PRESTEL, Stefan (Lund University)

Presenter: PRESTEL, Stefan (Lund University)

Session Classification: Monday 1