

QCD@LHC 2024

Report of Contributions

Contribution ID: 2

Type: **not specified**

QCD aspects in W and Z production, with focus on high p_T

Monday 7 October 2024 11:00 (30 minutes)

Presenter: CASTILLO, Florencia Luciana (Centre National de la Recherche Scientifique (FR))

Session Classification: Plenary session

Contribution ID: 3

Type: **not specified**

Event generators (recent developments)

Monday 7 October 2024 11:30 (30 minutes)

Presenter: SCHUMANN, Steffen

Session Classification: Plenary session

Contribution ID: 4

Type: **not specified**

Advances in resummed calculations

Monday 7 October 2024 09:40 (30 minutes)

Presenter: BECHER, Thomas (University of Bern)

Session Classification: Plenary session

Contribution ID: 5

Type: **not specified**

Welcome

Monday 7 October 2024 09:00 (10 minutes)

Presenter: DITTMAIER, Stefan (University of Freiburg)

Session Classification: Plenary session

Contribution ID: 6

Type: **not specified**

Overview of higher-order calculations

Monday 7 October 2024 09:10 (30 minutes)

Presenter: TANCREDI, Lorenzo (Technische Universitat Munchen (DE))

Session Classification: Plenary session

Contribution ID: 7

Type: **not specified**

Strong coupling measurements at the LHC

Monday 7 October 2024 10:10 (30 minutes)

Presenter: GUGLIELMI, Valentina (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Plenary session

Contribution ID: 8

Type: **not specified**

Parton showers (recent developments)

Monday 7 October 2024 12:00 (30 minutes)

Presenter: PLATZER, Simon (University of Graz (AT))

Session Classification: Plenary session

Contribution ID: 9

Type: **not specified**

Precision Higgs calculations

Tuesday 8 October 2024 09:00 (30 minutes)

Presenter: HEINRICH, Gudrun (KIT)

Session Classification: Plenary session

Contribution ID: **10**

Type: **not specified**

Status of Higgs boson precision measurements

Tuesday 8 October 2024 09:30 (30 minutes)

Presenter: ERDMANN, Johannes (RWTH Aachen University)

Session Classification: Plenary session

Contribution ID: 11

Type: **not specified**

Status of electroweak parameter measurements

Tuesday 8 October 2024 10:00 (30 minutes)

Presenter: DERUE, Frederic (LPNHE-Paris CNRS/IN2P3)

Session Classification: Plenary session

Contribution ID: 12

Type: **not specified**

Electroweak multi-boson production and scattering

Tuesday 8 October 2024 11:00 (30 minutes)

Presenter: DENNER, Ansgar (Julius Max. Universitaet Wuerzburg (DE))

Session Classification: Plenary session

Contribution ID: 13

Type: **not specified**

EFT fits and interpretations

Tuesday 8 October 2024 11:30 (30 minutes)

Presenter: BIEKOETTER, Anke (JGU Mainz)

Session Classification: Plenary session

Contribution ID: 14

Type: **not specified**

Overview on BSM searches

Tuesday 8 October 2024 12:00 (30 minutes)

Presenter: REGNERY, Brendan (KIT - Karlsruhe Institute of Technology (DE))

Session Classification: Plenary session

Contribution ID: 15

Type: **not specified**

Precision calculations for heavy-quark production

Wednesday 9 October 2024 09:00 (30 minutes)

Presenter: PONCELET, Rene (IFJ PAN Krakow)

Session Classification: Plenary session

Contribution ID: 16

Type: **not specified**

Recent experimental results on top and heavy-flavour production

Wednesday 9 October 2024 09:30 (30 minutes)

Presenter: KUHL, Thorsten (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Plenary session

Contribution ID: 17

Type: **not specified**

Flavour-sensitive jet algorithms

Wednesday 9 October 2024 10:00 (30 minutes)

Presenter: STAGNITTO, Giovanni (University of Milano Bicocca)

Session Classification: Plenary session

Contribution ID: **18**

Type: **not specified**

Anomalies in the flavour sector - current status -

Wednesday 9 October 2024 11:30 (30 minutes)

Presenter: PETRIDIS, Konstantinos (University of Bristol (GB))

Session Classification: Plenary session

Contribution ID: 19

Type: **not specified**

Exotic hadrons at the LHC

Presenter: NEEDHAM, Matthew David (The University of Edinburgh (GB))

Session Classification: Plenary session

Contribution ID: 20

Type: **not specified**

QCD and flavour physics at future lepton colliders

Wednesday 9 October 2024 12:00 (30 minutes)

Presenter: AMHIS, Yasmine Sara (IJCLab/CERN)

Session Classification: Plenary session

Contribution ID: 21

Type: **not specified**

Impact of QCD and PDF uncertainties on SM precision measurements

Thursday 10 October 2024 09:00 (30 minutes)

Presenter: SEIDEL, Markus (Riga Technical University (LV))

Session Classification: Plenary session

Contribution ID: 22

Type: **not specified**

Impact of QCD and PDF uncertainties on BSM searches

Thursday 10 October 2024 09:30 (30 minutes)

Presenter: MUSKINJA, Miha (Jozef Stefan Institute (SI))

Session Classification: Plenary session

Contribution ID: 23

Type: **not specified**

PDF constraints from new data and expectations from future experiments

Thursday 10 October 2024 10:00 (30 minutes)

Presenter: Dr CRUZ MARTINEZ, Juan M. (CERN)

Session Classification: Plenary session

Contribution ID: 24

Type: **not specified**

Recent advances in PDFs from lattice QCD

Thursday 10 October 2024 11:00 (30 minutes)

Presenter: Prof. CONSTANTINO, Martha

Session Classification: Plenary session

Contribution ID: 25

Type: **not specified**

Highlights of heavy-ion collisions at the LHC

Thursday 10 October 2024 11:30 (30 minutes)

Presenter: FRAGIACOMO, Enrico (Universita e INFN Trieste (IT))

Session Classification: Plenary session

Contribution ID: 26

Type: **not specified**

Results on ultra-peripheral heavy-ion collisions

Session Classification: Plenary session

Contribution ID: 27

Type: **not specified**

Soft QCD in MC event generators, multi-parton interactions

Friday 11 October 2024 09:00 (30 minutes)

Presenter: GAUNT, Jonathan Richard (University of Manchester (GB))

Session Classification: Plenary session

Contribution ID: 28

Type: **not specified**

Soft QCD measurements, diffractive processes

Friday 11 October 2024 09:30 (30 minutes)

Presenter: Dr GIULI, Francesco (CERN)

Session Classification: Plenary session

Contribution ID: 29

Type: **not specified**

Status of QCD calculations for $g-2$ predictions

Friday 11 October 2024 10:00 (30 minutes)

Presenter: EL-KHADRA, Aida

Session Classification: Plenary session

Contribution ID: **30**

Type: **not specified**

Concluding talk

Friday 11 October 2024 11:00 (1 hour)

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

Session Classification: Plenary session

Contribution ID: 31

Type: **not specified**

Precision calculation for di-Higgs production

Monday 7 October 2024 14:00 (30 minutes)

Presenter: YU, Huai-Min

Session Classification: Higgs, EW, BSM physics

Contribution ID: 32

Type: **not specified**

Di-Higgs production measurements and EFT interpretations

Monday 7 October 2024 14:30 (30 minutes)

Presenter: READIOFF, Nathan Peter (University of Sheffield (GB))

Session Classification: Higgs, EW, BSM physics

Contribution ID: 33

Type: **not specified**

Measurement of Higgs rare productions and decay modes

Monday 7 October 2024 15:00 (30 minutes)

Presenter: RASPIAREZA, Aliaksei (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Higgs, EW, BSM physics

Contribution ID: 34

Type: **not specified**

Extended Higgs sectors and their corresponding trilinear couplings

Monday 7 October 2024 16:00 (30 minutes)

Presenter: BRAATHEN, Johannes (DESY)

Session Classification: Higgs, EW, BSM physics

Contribution ID: 35

Type: **not specified**

SMEFT in the Higgs sector: higher loop contributions

Monday 7 October 2024 16:30 (30 minutes)

Presenter: VITTI, Marco

Session Classification: Higgs, EW, BSM physics

Contribution ID: 36

Type: **not specified**

BSM Higgs searches (incl. exotic Higgs decays)

Monday 7 October 2024 17:00 (30 minutes)

Presenter: TEOH, Jia Jian (University of Toronto (CA))

Session Classification: Higgs, EW, BSM physics

Contribution ID: 37

Type: **not specified**

Theory and phenomenology of gauge-boson polarisations at the LHC

Tuesday 8 October 2024 16:00 (30 minutes)

Presenter: PELLICCIOLI, Giovanni (Max-Planck-Institut für Physik)

Session Classification: Higgs, EW, BSM physics

Contribution ID: 38

Type: **not specified**

Diboson/triboson production and polarization measurements

Tuesday 8 October 2024 16:30 (30 minutes)

Presenter: BHATTACHARYA, Saptaparna (Wayne State University (US))

Session Classification: Higgs, EW, BSM physics

Contribution ID: 39

Type: **not specified**

Vector-boson fusion/scattering measurements

Tuesday 8 October 2024 17:00 (30 minutes)

Presenter: Ms CARRIVALE, Costanza (Universita e INFN, Perugia (IT))

Session Classification: Higgs, EW, BSM physics

Contribution ID: 40

Type: **not specified**

Mixed EW-QCD corrections for the Drell-Yan process at the LHC

Thursday 10 October 2024 14:00 (30 minutes)

Presenter: ARMADILLO, Tommaso

Session Classification: Higgs, EW, BSM physics

Contribution ID: 41

Type: **not specified**

Electroweak Sudakov logarithms in event generators

Thursday 10 October 2024 14:30 (30 minutes)

Presenter: VITOS, Timea

Session Classification: Higgs, EW, BSM physics

Contribution ID: 42

Type: **not specified**

Single boson (W, Z, H) cross-section measurements

Thursday 10 October 2024 15:00 (30 minutes)

Presenter: GOBLIRSCH-KOLB, Maximilian Emanuel (CERN)

Session Classification: Higgs, EW, BSM physics

Contribution ID: 43

Type: **not specified**

Heavy quark production and the variable-flavor-number-scheme at NNLO

Wednesday 9 October 2024 11:00 (30 minutes)

Presenter: SCHÖNWALD, Kay (University of Zuerich)

Session Classification: Plenary session

Contribution ID: 44

Type: **not specified**

Lattice Calculation of Distribution Amplitude for Mesons

Thursday 10 October 2024 16:00 (30 minutes)

We present a lattice QCD calculation of the distribution amplitudes for pseudoscalar mesons, specifically the pion and kaon, as well as for polarized vector mesons, K^* and ϕ , using large momentum effective theory. This study employs the clover fermion action across three ensembles with 2+1+1 flavors of highly improved staggered quarks, as generated by the MILC Collaboration at physical pion mass and lattice spacings of $\{0.06, 0.09, 0.12\}$ fm. The lattice matrix elements obtained are nonperturbatively renormalized using a recently proposed hybrid scheme with self-renormalization, and they are reliably extrapolated to both the continuum and the infinite momentum limits. We also investigated the systematic uncertainties from various aspects.

Presenter: CHU, Min-Huan (Adam Mickiewicz University)

Session Classification: PDFs

Contribution ID: 45

Type: **not specified**

Lattice calculations of GPDs and their uncertainties

Thursday 10 October 2024 16:30 (30 minutes)

Using the recent calculation of GPD moments by the Hadstruc collaboration in the pseudo-distribution formalism, I will present the possibilities and challenges faced in terms of uncertainty. I will notably discuss the questions of the continuum limit, higher twist contamination, perturbative matching and inverse problem reconstruction for the x-dependence.

Presenter: DUTRIEUX, Herve (William and Mary)

Session Classification: PDFs

Contribution ID: 46

Type: **not specified**

TMDs from lattice QCD

Thursday 10 October 2024 17:00 (30 minutes)

Presenter: WAGMAN, Michael

Session Classification: PDFs

Contribution ID: 47

Type: **not specified**

CTEQ Updates

Tuesday 8 October 2024 14:00 (30 minutes)

Presenter: Dr HOBBS, TIMOTHY J (Argonne National Laboratory)

Session Classification: PDFs

Contribution ID: 48

Type: **not specified**

NNPDF Updates

Tuesday 8 October 2024 14:30 (30 minutes)

Presenter: STEGEMAN, Roy

Session Classification: PDFs

Contribution ID: 49

Type: **not specified**

ABMP Updates

Tuesday 8 October 2024 15:00 (30 minutes)

Presenter: ZENAIEV, Oleksandr

Session Classification: PDFs

Contribution ID: 50

Type: **not specified**

Towards splitting functions at four-loop order

Monday 7 October 2024 14:00 (30 minutes)

Presenter: YANG, Tongzhi

Session Classification: PDFs

Contribution ID: 51

Type: **not specified**

Progress in the calculation of N3LO splitting functions

Monday 7 October 2024 14:30 (30 minutes)

Presenter: MOCH, Sven-Olaf (Deutsches Elektronen-Synchrotron (DE))

Session Classification: PDFs

Contribution ID: 52

Type: **not specified**

Explainable AI classification for parton density theory

Monday 7 October 2024 15:00 (30 minutes)

Presenter: KRIESTEN, Brandon

Session Classification: PDFs

Contribution ID: 57

Type: **not specified**

Multijet and multi-differential dijet measurements with ATLAS and CMS

Monday 7 October 2024 14:00 (30 minutes)

Presenter: ZIAKA, Argyro (University of Ioannina (GR))

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 58

Type: **not specified**

Determinations of alphas with ATLAS and CMS

Monday 7 October 2024 14:30 (30 minutes)

Presenter: KUPRASH, Oleg (Albert Ludwigs Universitaet Freiburg (DE))

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 59

Type: **not specified**

Theory uncertainties in the extraction of α_S from the Z pT

Monday 7 October 2024 15:00 (30 minutes)

Presenter: MARINELLI, Giulia

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: **60**

Type: **not specified**

RG-improved resummation of super-leading logarithms

Monday 7 October 2024 16:00 (30 minutes)

Presenters: BÖER, Philipp; Dr BÖER, Philipp (TU Munich); BÖER, Philipp

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: **61**

Type: **not specified**

Jet substructure studies with ATLAS and CMS

Monday 7 October 2024 16:30 (30 minutes)

Presenters: SELEM, Luka; SELEM, Luka (Centre National de la Recherche Scientifique (FR))

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 62

Type: **not specified**

Locally finite two-loop amplitudes in gluon fusion for multi Higgs production

Monday 7 October 2024 17:00 (30 minutes)

Presenter: KARLEN, Julia (ETH Zurich)

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 63

Type: **not specified**

Five-parton scattering in the high-energy limit

Tuesday 8 October 2024 14:00 (30 minutes)

The availability of high-multiplicity multi-loop scattering amplitudes in QCD provides invaluable data for studying the theory under special kinematic configurations. Recent calculations of two-loop full-colour QCD amplitudes for the scattering of five partons have enabled us to explore their high-energy limit, known as Multi-Regge Kinematics (MRK). In this limit, a universal factorisation pattern is expected for the amplitude. However, starting at the next-to-next-to-leading logarithmic order (NNLL), the exchange of multiple reggeons (MR) disrupts this factorisation.

In this talk, I will first review the effective theory that accurately describes the high-energy limit and how it predicts the MR contributions. Once the latter are properly accounted for, the universal factorisation pattern is restored. This restoration allowed us to extract a fundamental ingredient for the factorisation at NNLL: the Lipatov vertex at two-loop order. I will also delve into various technical details of how this calculation was carried out.

Presenters: BUCCIONI, Federico; BUCCIONI, Federico; BUCCIONI, Federico (University of Zurich)

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 64

Type: **not specified**

Two-loop virtual contributions to $qq \rightarrow ttH$ production, numerically

Tuesday 8 October 2024 14:30 (30 minutes)

I'd like to present the numerical calculation of the N_f -part of the 2-loop 5-point massive virtual amplitudes for $qq \rightarrow ttH$ production based on arXiv:2402.03301, describing the methods (i.e. sector decomposition), the tools (pySecDec and Ratracer), and the outlook for the remaining work.

Presenter: MAGERYA, Vitaly

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 65

Type: **not specified**

[Canceled] Anomalous dimensions of soft functions at subleading power

Tuesday 8 October 2024 15:00 (30 minutes)

Presenters: WANG, Xing; WANG, Xing (TU Munich)

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 66

Type: **not specified**

Associated production of bosons and light jets with ATLAS and CMS

Thursday 10 October 2024 16:00 (30 minutes)

Co-author: VASQUEZ, Julia

Presenters: FERNANDEZ RAMOS, Juan Pablo (CIEMAT - Centro de Investigaciones Energéticas Medioambientales y Tec. (ES)); VASQUEZ, Julia

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 67

Type: **not specified**

Measurements of a vector boson and heavy-flavor jets with ATLAS and CMS

Thursday 10 October 2024 16:30 (30 minutes)

Presenter: KAUR, Sandeep (Carleton University (CA))

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 68

Type: **not specified**

Z boson production in association with bottom quarks at NNLO+PS

Thursday 10 October 2024 17:00 (30 minutes)

Presenters: MAZZITELLI, Javier; MAZZITELLI, Javier (Paul Scherrer Institut (CH)); MAZZITELLI, Javier (Universidad de Buenos Aires (AR))

Session Classification: Perturbative and resummed predictions in QCD

Contribution ID: 69

Type: **not specified**

Parton showers and event generators studies and modelling from ATLAS and CMS

Tuesday 8 October 2024 14:00 (30 minutes)

Presenter: JIN, Weijie (University of Zurich (CH))

Session Classification: Parton showers and event generators

Contribution ID: 70

Type: **not specified**

MiNNLOPS event-generator: colour singlet plus one jet events

Tuesday 8 October 2024 14:30 (30 minutes)

Presenter: ZANOLI, Silvia (University of Oxford)

Session Classification: Parton showers and event generators

Contribution ID: 71

Type: **not specified**

Geneva event-generator: colour-singlet plus one jet events

Tuesday 8 October 2024 15:00 (30 minutes)

Presenter: NAPOLETANO, Davide (Universita & INFN, Milano-Bicocca (IT))

Session Classification: Parton showers and event generators

Contribution ID: 72

Type: **not specified**

Recent progress of CVolver

Thursday 10 October 2024 16:30 (30 minutes)

Presenter: TORRE GONZÁLEZ, Fernando (The University of Manchester)

Session Classification: Parton showers and event generators

Contribution ID: 73

Type: **not specified**

Log accuracy in parton showers

Thursday 10 October 2024 16:00 (30 minutes)

Presenter: Dr KARLBERG, Alexander (CERN)

Session Classification: Parton showers and event generators

Contribution ID: 74

Type: **not specified**

Efficiency of event generators

Thursday 10 October 2024 17:00 (30 minutes)

Presenters: BOTHMANN, Enrico; BOTHMANN, Enrico (University of Göttingen)

Session Classification: Parton showers and event generators

Contribution ID: 75

Type: **not specified**

Theoretical predictions for ttW and ttZ production

Monday 7 October 2024 16:00 (30 minutes)

Presenter: Prof. KIDONAKIS, Nikolaos

Session Classification: Heavy quarks

Contribution ID: 76

Type: **not specified**

Energy correlators for top mass measurement

Monday 7 October 2024 16:30 (30 minutes)

Presenter: Dr PATHAK, Aditya (DESY)

Session Classification: Heavy quarks

Contribution ID: 77

Type: **not specified**

Modelling off-shell effects with machine learning

Monday 7 October 2024 17:00 (30 minutes)

Presenter: KUSCHICK, Mathias

Session Classification: Heavy quarks

Contribution ID: 78

Type: **not specified**

Binding mechanisms for exotic states

Tuesday 8 October 2024 16:00 (30 minutes)

Presenter: SANTOPINTO, Elena (INFN e Universita Genova (IT))

Session Classification: Heavy quarks

Contribution ID: 79

Type: **not specified**

NRQCD description of multiquark states

Tuesday 8 October 2024 16:30 (30 minutes)

Presenter: MOHAPATRA, Abhishek (Technical University of Munich)

Session Classification: Heavy quarks

Contribution ID: **80**

Type: **not specified**

Left-hand cut problem and doubly heavy tetraquarks

Tuesday 8 October 2024 17:00 (30 minutes)

Presenter: BARU, Vadim

Session Classification: Heavy quarks

Contribution ID: 81

Type: **not specified**

Observable CP-violation in charmed baryons decays with SU(3) symmetry analysis

Thursday 10 October 2024 14:00 (30 minutes)

Presenter: XING, Zhi-Peng (NanJing Normal University)

Session Classification: Heavy quarks

Contribution ID: 82

Type: **not specified**

Revisiting $D \rightarrow \pi \ell \ell$ decays in the Standard Model, using LCSRs

Thursday 10 October 2024 14:30 (30 minutes)

Presenters: BANSAL, Anshika (Physical Research Laboratory, Ahmedabad); BANSAL, Anshika

Session Classification: Heavy quarks

Contribution ID: 83

Type: **not specified**

Precision meets new physics in the heavy-quark expansion

Thursday 10 October 2024 15:00 (30 minutes)

Presenters: LANG, Martin; LANG, Martin Sebastian; LANG, Martin Sebastian

Session Classification: Heavy quarks

Contribution ID: **84**

Type: **not specified**

Soft Physics in EPOS

Tuesday 8 October 2024 16:00 (30 minutes)

Presenter: Dr PIEROG, Tanguy

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: 85

Type: **not specified**

Recent soft QCD results from ATLAS and LHCf

Tuesday 8 October 2024 16:30 (30 minutes)

Presenter: MORENO MARTINEZ, Carlos (Universite de Geneve (CH))

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: 86

Type: **not specified**

Event shape variables in pp collisions in CMS

Presenter: JIN, Weijie (University of Zurich (CH))

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: 87

Type: **not specified**

Central exclusive diffraction in UPC at LHCb experiment

Tuesday 8 October 2024 17:00 (30 minutes)

Presenter: MCNULTY, Ronan (University College Dublin (IE))

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: **88**

Type: **not specified**

Searching for QGP signals in small systems at the LHC

Thursday 10 October 2024 14:00 (30 minutes)

Presenter: KIM, Dong Jo (University of Jyvaskyla (FI))

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: **89**

Type: **not specified**

Soft Physics in Pythia

Thursday 10 October 2024 14:30 (30 minutes)

Presenter: LÖNNBLAD, Leif (Lund University (SE))

Session Classification: Soft interactions, non-perturbative QCD

Contribution ID: 90

Type: **not specified**

Event shape variables in pp collisions in CMS

Thursday 10 October 2024 15:00 (30 minutes)

Presenter: JIN, Weijie (University of Zurich (CH))

Session Classification: Soft interactions, non-perturbative QCD