QCD@LHC 2018

Report of Contributions

Contribution ID: **1**   Type: **not specified**

Determination of the strong coupling constant alphas(MZ) in next-to-next-to-leading order QCD using H1 jet cross section measurements

Tuesday, 28 August 2018 14:30 (25 minutes)

The strong coupling constant α_s is determined from inclusive jet and dijet cross sections in neutral-current deep-inelastic ep scattering (DIS) measured at HERA by the H1 collaboration using next-to-next-to-leading order (NNLO) QCD predictions. The dependence of the NNLO predictions and of the resulting value of $\alpha_s(m_Z)$ at the Z-boson mass m_Z are studied as a function of the choice of the renormalisation and factorisation scales. Using inclusive jet and dijet data together, the strong coupling constant is determined to be $\alpha_s(m_Z) = 0.1157\,(20)_{exp}\,(29)_{th}$. Complementary, $\alpha_s(m_Z)$ is determined together with parton distribution functions of the proton (PDFs) from jet and inclusive DIS data measured by the H1 experiment. The value $\alpha_s(m_Z) = 0.1142\,(28)_{tot}$ obtained is consistent with the determination from jet data alone. The impact of the jet data on the PDFs is studied. The running of the strong coupling is tested at different values of the renormalisation scale and the results are found to be in agreement with expectations.

Eur.Phys.J.C77 (2017), 791 [arxiv:1709.07251]

Primary authors: SCHMITT, Stefan (Deutsches Elektronen-Synchrotron (DE)); BRITZGER, Daniel (Ruprecht Karls Universitaet Heidelberg (DE))

Presenter: BRITZGER, Daniel (Ruprecht Karls Universitaet Heidelberg (DE))

Session Classification: PDFs, ⎘ₛ and soft QCD

Track Classification: PDFs, ⎘ₛ and soft QCD

Contribution ID: **2**   Type: **not specified**

Determination of electroweak parameters in polarised deep-inelastic scattering at HERA

Monday, 27 August 2018 16:30 (18 minutes)

The parameters of the electroweak theory are determined in a combined electroweak and QCD analysis using all deep-inelastic e^+p and e^-p neutral current and charged current scattering cross sections published by the H1 Collaboration, including data with longitudinally polarised lepton beams. The mass of the W boson in the on-shell scheme is determined as
$mW = 80.508 \pm 0.115$
GeV. The axial-vector and vector couplings of the light quarks to the Z boson are also determined. Both results improve the precision of previous H1 determinations based on HERA-I data by about a factor of two. Possible scale dependence of the weak coupling parameters in both neutral and charged current interactions beyond the Standard Model is also studied. All results are found to be consistent with the Standard Model expectations.

Primary author: SCHMITT, Stefan (Deutsches Elektronen-Synchrotron (DE))

Presenter: RIZVI, Eram Syed (Queen Mary, University of London)

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **3**   Type: **not specified**

Combination and QCD analysis of beauty and charm production cross section measurements in deep inelastic ep scattering at HERA

Thursday, 30 August 2018 16:30 (25 minutes)

Measurements of open charm and beauty production cross sections in deep inelastic ep scattering at HERA from the H1 and ZEUS Collaborations are combined. Reduced cross sections are obtained in the kinematic range of negative four-momentum transfer squared of the photon $2.5~\text{GeV}^2 \leq Q^2 \leq 2000$ GeV^2 and Bjorken scaling variable $3 \cdot 10^{-5} \leq x_{\text{Bj}} \leq 5 \cdot 10^{-2}$. The combination method accounts for the correlations of the statistical and systematic uncertainties among the different datasets. Perturbative QCD calculations are compared to the combined data. A next-to-leading order QCD analysis is performed using these data together with the combined inclusive deep inelastic scattering cross sections from HERA. The running charm- and beauty-quark masses are determined as $m_c(m_c) = 1.290^{+0.046}_{-0.041}(\text{exp/fit})\ ^{+0.062}_{-0.014}(\text{model})\ ^{+0.003}_{-0.031}(\text{parameterisation})$ GeV and $m_b(m_b) = 4.049^{+0.104}_{-0.109}(\text{exp/fit})\ ^{+0.090}_{-0.032}(\text{model})\ ^{+0.001}_{-0.031}(\text{parameterisation})$ GeV.

arxiv:1804.01019, accepted by EPJC.

Primary author: SCHMITT, Stefan (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **4**   Type: **not specified**

SHERPA: where we are and what's next

Monday, 27 August 2018 15:30 (25 minutes)

In this status report on the multi-purpose Monte-Carlo event generator Sherpa I review recent and ongoing Sherpa studies, as well as the latest developments of its fixed-order and all-order technologies. Fixed-order improvements I discuss include fully automated EW corrections and support for additional loop-induced processes. On the all-order side I cover Sherpa's parton showers and the recent work on including NLO splitting kernels, studying the accuracy of the showers and their on-the-fly reweighting in state-of-the-art simulations.

Primary author: BOTHMANN, Enrico (University of Edinburgh)

Presenter: BOTHMANN, Enrico (University of Edinburgh)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **5**   Type: **not specified**

Differential jet cross sections at the CMS experiment

Tuesday, 28 August 2018 15:30 (25 minutes)

We present measurements of differential jet cross sections over a wide range in transverse momenta from inclusive jets to multi-jet final states. Studies on the impact that these measurements have on the determination of the strong coupling alpha_s as well as on parton density functions are reported.

Presenter: Mr CHATTERJEE, Suman (Tata Inst. of Fundamental Research (IN))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **6**   Type: **not specified**

Automated calculation of two-loop soft functions in SCET

Thursday, 30 August 2018 17:14 (17 minutes)

Perturbative calculations for many collider observables suffer from large logarithmic corrections associated with soft emissions or radiation collinear to beam or jet directions. Resummation using SCET techniques is based on factorisation theorems, and requires the calculation of jet, soft and beam functions to some perturbative accuracy. This task has up to now mainly been achieved analytically, on a case-by-case basis.

To facilitate the resummation of global logarithms to NNLL accuracy, we present a framework to numerically compute the two-loop soft function for a general class of observables containing e.g. e+e-event shapes and inclusive hadron collider observables. The algorithm has been implemented in the publicly available program SoftSERVE, and is currently limited to processes with two hard (coloured) directions. I will present the general strategy of our approach, some new results for event-shape and jet-grooming observables, as well as recent progress on extending the setup to processes with more than two jet-like directions.

Primary authors: DEHNADI, Bahman; BELL, Guido (University of Siegen); TALBERT, Jim (DESY); RAHN, Rudi (University of Bern)

Presenter: RAHN, Rudi (University of Bern)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **8**   Type: **not specified**

Resummation of Non-global Logarithms in Effective Field Theory

Thursday, 30 August 2018 17:36 (17 minutes)

Starting from a factorization theorem in effective field theory, we derive a parton-shower equation for the resummation of non-global logarithms. We have implemented this shower and interfaced it with a tree-level event generator to obtain an automated framework to resum the leading logarithm of non-global observables in the large-Nc limit. Using this setup, we compute gap fractions for dijet processes and isolation cone cross sections relevant for photon production. We compare our results with fixed-order computations and LHC measurements. We find that naive exponentiation is often not adequate, especially when the vetoed region is small since non-global contributions are enhanced due to their dependence on the veto-region size.

Primary author: Dr SHAO, Dingyu (CERN)

Presenter: Dr SHAO, Dingyu (CERN)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **9** Type: **not specified**

Two-loop five-gluon helicity amplitudes in QCD via integrand reduction

Tuesday, 28 August 2018 14:30 (25 minutes)

I will present a calculation of the leading-colour five-gluon amplitude at two loop in QCD. The calculation is performed by means of D-dimensional integrand reduction method, complemented with the finite-field reconstruction techniques and momentum twistor parameterization. Numerical results for all helicity configurations are obtained by employing both sector decomposition methods and IBP reduction to master integrals.

Primary author: HARTANTO, Heribertus Bayu (Durham University)

Co-authors: BADGER, Simon (Durham University, IPPP); PERARO, Tiziano; BRONNUM-HANSEN, Christian

Presenter: HARTANTO, Heribertus Bayu (Durham University)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **10**   Type: **not specified**

Using Pseudo-Dipoles for Resonance-Aware NLO-Subtraction

Tuesday, 28 August 2018 17:14 (17 minutes)

NLO-subtraction schemes such as CS-dipole-subtraction are indispensable for MC-Generators to calculate real and virtual corrections efficiently. However, those algorithms suffer from numerical inefficiencies and even cause distortions in physical distributions when interfaced with parton showers, if the process in question comprises potentially resonant particles.

In this talk I will elucidate this matter and offer an alternative subtraction-scheme, which makes use of so called pseudo-dipoles. I will show results, which have been calculated with a SHERPA-implementation of this new pseudo-dipole-subtraction and compare them to the ones obtained with ordinary CS-dipole-subtraction.

Primary authors: LIEBSCHNER, Sebastian (IKTP Dresden); SIEGERT, Frank (Technische Universitaet Dresden (DE)); Dr HOECHE, Stefan (SLAC)

Presenter: LIEBSCHNER, Sebastian (IKTP Dresden)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **11**   Type: **not specified**

Three loop QCD corrections to heavy quark form factors

Thursday, 30 August 2018 17:00 (25 minutes)

We present color planar and complete light quark QCD contributions to the three loop heavy quark form factors in the case of vector, axialvector, scalar and pseudoscalar currents. We evaluate the master integrals applying a new method based on differential equations for general bases, which is applicable for all first order factorizing systems. The analytic results are expressed in terms of harmonic polylogarithms and real-valued cyclotomic harmonic polylogarithms.

Primary authors: Dr SCHNEIDER, Carsten; ABLINGER, Jakob; Prof. BLUEMLEIN, Johannes (DESY); Dr RANA, Narayan (DESY); MARQUARD, Peter (DESY)

Presenter: Dr RANA, Narayan (DESY)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **12**   Type: **not specified**

The automation of next-to-leading order electroweak calculations in MadGraph5_aMC@NLO

Monday, 27 August 2018 15:00 (25 minutes)

We discuss the automation of the calculation of leading- and next-to-leading order contributions to short-distance cross sections at hadron colliders. With the new public version of the code Mad-Graph5_aMC@NLO, not only NLO QCD and EW corrections but also all the subleading contributions in a mixed QCD and EW coupling expansion can now be calculated. We discuss the key features for obtaining the complete automation and we show various relevant phenomenological results that can can be obtained with the current version of MadGraph5_aMC@NLO.

Primary authors: FREDERIX, Rikkert (TUM); FRIXIONE, Stefano (CERN); HIRSCHI, Valentin (ETHZ - ETH Zurich); PAGANI, Davide (TUM - Garching bei München); SHAO, Huasheng (Centre National de la Recherche Scientifique (FR)); ZARO, Marco (Nikhef National institute for subatomic physics (NL))

Presenter: PAGANI, Davide (TUM - Garching bei München)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **13**   Type: **not specified**

High-energy resummation for the background to weak boson fusion

Tuesday, 28 August 2018 15:14 (17 minutes)

The weak boson fusion contribution to Higgs boson production is enhanced significantly by requiring a large invariant mass and rapidity separation between the associated jets. This induces large logarithmic corrections in the prediction for the gluon-fusion background, which are incorporated to all orders within the High Energy Jets (HEJ) formalism. We present HEJ predictions for the gluon-fusion production of a Higgs boson in association with at least two jets, matched to fixed-order predictions at leading and next-to-leading order and including corrections due to finite top and bottom quark masses.

Primary authors: ANDERSEN, Jeppe Rosenkrantz (IPPP, University of Durham (UK));   Mr HEIL, Marian (IPPP, Durham University);   MAIER, Andreas (Durham University);   SMILLIE, Jennifer (Higgs Centre for Theoretical Physics, Edin. U.)

Presenter: MAIER, Andreas (Durham University)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **14**   Type: **not specified**

Soft Gluon Evolution and Colour Reconnection

Tuesday, 28 August 2018 16:52 (17 minutes)

We consider soft gluon evolution of a system of clusters forming the initial state of the cluster hadronziation model, in order to constrain colour reconnection models from a perturbative point of view.
We show that this ansatz produces clusters with properties attributed to
a colour pre-confined state and find strong evidence for formerly investigated colour reconnection models based on geometric properties.
We also explore the possibility of colour flows giving rise to
baryonic clusters and propose a simple parametrization to incorporate the
effects of soft gluon evolution in a full monte carlo event generator.

Primary authors: GIESEKE, Stefan (Karlsruhe Institute of Technology); KIRCHGAESSER, Patrick; PLATZER, Simon (University of Vienna (AT)); SIODMOK, Andrzej Konrad (Polish Academy of Sciences (PL))

Presenter: KIRCHGAESSER, Patrick

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **15**   Type: **not specified**

Renomalization of QCD at four and five loops

Thursday, 30 August 2018 17:00 (25 minutes)

We present an overview of the current status of calculations for the QCD renormalization constants.

Primary author: MARQUARD, Peter (DESY)

Presenter: MARQUARD, Peter (DESY)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **16**   Type: **not specified**

Matching and merging with massive b-quarks

Thursday, 30 August 2018 15:36 (17 minutes)

We present a new algorithm to incorporate calculations with massive b-quarks, usually performed in the four flavour scheme, into a merged simulation obtained in the five flavour scheme. We apply this algorithm to $tt +$ jets / $ttbb$ production, study the uncertainties of this newly developed method and compare our results to dedicated 4F/5F simulations.

Primary authors: KRAUSE, Johannes (TU Dresden);   HOECHE, Stefan (SLAC);   KATZY, Judith (Deutsches Elektronen-Synchrotron (DE)); POLLARD, Chris (Deutsches Elektronen-Synchrotron (DE)); SIEGERT, Frank (Technische Universitaet Dresden (DE))

Presenter: KRAUSE, Johannes (TU Dresden)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **17**   Type: **not specified**

Jet(s) with the CoLoRFulNNLO framework

Tuesday, 28 August 2018 15:00 (25 minutes)

We observe more and more advances in the technology of multiloop calculations. Hence it is of utmost importance to develop computational frameworks which can tackle the computational burden presented by the regularization of up to two unresolved parton emissions coming from the matrix elements. CoLoRFulNNLO is such a framework built around local subtractions derived from first principles. In my talk I give a detailed overview of the framework with special emphasis on its application to LHC processes involving jet production.

Primary author: KARDOS, Adam (University of Debrecen)

Co-authors: BEVILACQUA, Giuseppe; SOMOGYI, Gabor (University of Debrecen (HU)); TROC-SANYI, Zoltan Laszlo (University of Debrecen (HU)); TULIPÁNT, Zoltán

Presenter: KARDOS, Adam (University of Debrecen)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **18**   Type: **not specified**

Mixed QCD-electroweak corrections to Higgs gluon fusion

Monday, 27 August 2018 16:53 (18 minutes)

The study of the Higgs boson properties is one of the main tasks of contemporary high-energy physics. Among Higgs properties, its interaction with gluons is interesting since it can be facilitated by yet unknown elementary particles. One of the major sources of uncertainty in the theoretical description of ggH coupling originates from mixed QCD-electroweak contributions. The NLO QCD corrections to these contributions were evaluated in the approximation where electroweak boson masses were considered to be significantly larger than the mass of the Higgs boson and it is desirable to compute these corrections for physical masses of the gauge bosons and the Higgs boson. I will present a major step towards this goal and describe first the analytic evaluation of NLO mixed QCD-EW three-loop virtual corrections to $gg \rightarrow H$, and then their implementation in the evaluation of the total cross section for $gg \rightarrow H$ in the soft-gluon approximation for real corrections.

Primary author: BONETTI, Marco (Karlsruhe Institute of Technology (KIT))

Presenter: BONETTI, Marco (Karlsruhe Institute of Technology (KIT))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **20**   Type: **not specified**

Production of Vector bosons in association with Heavy Flavor jets

The associated production of vector bosons, W or Z, and jets originating from heavy-flavour quarks (HF) provide tests of pertubative QCD predictions and to the modelling of HF production. These measurements are sensitive to the heavy quark parton content of the proton and are input to PDF analyses. This talk should cover the recent V+ HF measurement done by the CMS detector.

Primary author: CMS COLLABORATION

Presenter: CMS COLLABORATION

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **21**   Type: **not specified**

Latest results on VBF and VBS processes at CMS

Tuesday, 28 August 2018 15:16 (18 minutes)

This talk describe recent results on the measurement of the Electroweak production of V and VV + jets.

Presenter: SALFELD-NEBGEN, Jakob (Princeton University (US))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **22**   Type: **not specified**

Prospects for a measurement of the W boson mass in the all-jets final state at hadron colliders

Monday, 27 August 2018 17:30 (25 minutes)

Precise measurements of the mass of the W boson are important to test the overall consistency of the Standard Model of particle physics. The current best measurements of the W boson mass come from single production measurements at hadron colliders in its decay mode to a lepton (electron or muon) and a neutrino and pair production of W bosons at lepton colliders, where also the decay mode of the W boson to a quark anti-quark pair has been considered. In this study, prospects for a measurement of the W boson mass in the all-jets final state at hadron colliders are presented. Compared to other methods for measuring the W mass, a measurement in the all-jets final state would be complementary in methodology and have systematic uncertainties orthogonal to previous measurements. We have estimated the main experimental and theoretical uncertainties affecting a measurement in the all-jets final state making use of jet substructure techniques.

Primary authors: HINZMANN, Andreas (Hamburg University (DE)); TRAN, Nhan Viet (Fermi National Accelerator Lab. (US)); MOULT, Ian James; FREYTSIS, Marat (University of Oregon); VERNIERI, Caterina (Fermi National Accelerator Lab. (US)); HARRIS, Philip Coleman (Massachusetts Inst. of Technology (US))

Presenter: HINZMANN, Andreas (Hamburg University (DE))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **23**   Type: **not specified**

Measurements of jet mass and other jet substructure studies at CMS

This talk describes the measurement of the jets mass and other jet substructure studies at CMS

Primary author: CMS COLLABORATION

Presenter: CMS COLLABORATION

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: 24 Type: **not specified**

ttH(bb) in the all-hadronic final state

We present a search for the standard model Higgs boson decaying into b quarks and produced in association with a pair of top quarks decaying in the all-jet final state. This search is performed on 35.9 fb-1 of 13-TeV proton-proton collisions collected by the CMS experiment at the LHC. To separate the t̄tH signal from the irreducible t̄t + bb̄ background, this analysis takes advantage of a matrix element method. A data-driven method has been used to estimate the large multijet background.

Primary author: CMS COLLABORATION

Presenter: CMS COLLABORATION

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **25**   Type: **not specified**

Recent HH Results at CMS

Tuesday, 28 August 2018 16:30 (18 minutes)

The production of Higgs boson pairs (HH) offers a unique opportunity to explore the structure of the Higgs field potential through the determination of the Higgs boson self interaction. Despite being an extremely rare process, with a predicted cross section of about 33 fb at a center-of-mass energy of 13 TeV, variations of the Higgs couplings, or the presence of heavy resonances, might enhance the production rate and hence reveal the presence of physics beyond the Standard Model. The most recent results on searches for double Higgs production, obtained from the CMS Collaboration with data collected at sqrt(s) = 13 TeV, are here presented, with focus on the different decay channels explored and their combination.

Presenter: BRIVIO, Francesco (Universita & INFN, Milano-Bicocca (IT))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **26**   Type: **not specified**

Welcome from the organisers

Monday, 27 August 2018 09:00 (10 minutes)

Session Classification: Plenary

Contribution ID: **27**   Type: **not specified**

Determining the strong coupling constant (45' + 10')

Monday, 27 August 2018 09:10 (55 minutes)

Presenter: RABBERTZ, Klaus (KIT - Karlsruhe Institute of Technology (DE))

Session Classification: Plenary

Contribution ID: **28**   Type: **not specified**

Recent developments in PDFs (45' + 10')

Monday, 27 August 2018 10:05 (55 minutes)

Presenter: THORNE, Robert Samuel (University College London (UK))

Session Classification: Plenary

Contribution ID: **29**   Type: **not specified**

Progress in multiloop and multileg calculations (35' + 10')

Wednesday, 29 August 2018 11:30 (45 minutes)

Presenter: JONES, Stephen (MPI, Munich)

Session Classification: Plenary

Contribution ID: **30**   Type: **not specified**

EW corrections in the light of QCD precision (35' + 10')

Wednesday, 29 August 2018 12:15 (45 minutes)

Presenter: SCHOENHERR, Marek (CERN)

Session Classification: Plenary

Contribution ID: **31**   Type: **not specified**

Joint TH+EXP: QCD background processes in BSM searches (60' + 15')

Tuesday, 28 August 2018 09:00 (1h 15m)

Presenters: LINDERT, Jonas (University of Durham (GB));   GUNNELLINI, Paolo (University of Hamburg)

Session Classification: Plenary

Contribution ID: **32**   Type: **not specified**

QCD corrections for BSM signal processes (35' + 10')

Tuesday, 28 August 2018 10:15 (45 minutes)

Presenter: KULESZA, Anna (University of Muenster)

Session Classification: Plenary

Contribution ID: **33** Type: **not specified**

Heavy flavour production processes (35' + 10')

Thursday, 30 August 2018 11:30 (45 minutes)

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

Session Classification: Plenary

Contribution ID: 34   Type: **not specified**

Heavy flavour production and decay with LHCb (35' + 10')

Thursday, 30 August 2018 12:15 (45 minutes)

Presenter: SKIDMORE, Nicola Anne (Ruprecht Karls Universitaet Heidelberg (DE))

Session Classification: Plenary

Contribution ID: **35**   Type: **not specified**

Uncertainties and challenges in jet reconstruction in ATLAS (35' + 10')

Wednesday, 29 August 2018 09:00 (45 minutes)

Presenter: DATTAGUPTA, Aparajita (University of Oregon (US))

Session Classification: Plenary

Contribution ID: **36**   Type: **not specified**

Joint TH+EXP: Inclusive and dijet production at the LHC (60' + 15')

Wednesday, 29 August 2018 09:45 (1h 15m)

Presenters: MALAESCU, Bogdan (Centre National de la Recherche Scientifique (FR) & CERN); PIRES, Joao

Session Classification: Plenary

Contribution ID: **37**   Type: **not specified**

Recent results in Higgs and BSM searches at CMS (35' + 10')

Tuesday, 28 August 2018 11:30 (45 minutes)

Presenter: HORVATH, Dezso (Wigner RCP, Budapest (HU))

Session Classification: Plenary

Contribution ID: **38**   Type: **not specified**

QCD measurements with Heavy Ions (35' + 10')

Tuesday, 28 August 2018 12:15 (45 minutes)

Presenter: BIANCHI, Livio (Universita e INFN Torino (IT))

Session Classification: Plenary

Contribution ID: **39**   Type: **not specified**

Recent developments in resummation (35' + 10')

Presenter: ROTTOLI, Luca (University of Oxford)

Session Classification: Plenary

Contribution ID: **40** Type: **not specified**

Joint TH+EXP: Jet substructure and H/V/top-tagging (60' + 15')

Thursday, 30 August 2018 09:45 (1h 15m)

Presenters: FERREIRA DE LIMA, Danilo Enoque (Ruprecht Karls Universitaet Heidelberg (DE)); Dr MARZANI, Simone (Università di Genova and INFN Genova)

Session Classification: Plenary

Contribution ID: **41**   Type: **not specified**

Recent developments in resummation (35' + 10')

Friday, 31 August 2018 10:15 (45 minutes)

Presenter: ROTTOLI, Luca (University of Oxford)

Session Classification: Plenary

Contribution ID: **42**   Type: **not specified**

Joint TH+EXP: Pileup modelling and mitigation at the LHC (60' + 15')

Friday, 31 August 2018 09:00 (1h 15m)

Presenters: CACCIARI, Matteo (LPTHE Jussieu); HASEGAWA, Satoshi (Fermi National Accelerator Lab. (US))

Session Classification: Plenary

Contribution ID: 43   Type: **not specified**

Recent developments in Monte Carlo event generators (35' + 10')

Friday, 31 August 2018 11:30 (45 minutes)

Presenter: KUTTIMALAI, Silvan (SLAC)

Session Classification: Plenary

Contribution ID: 44   Type: **not specified**

Physics of the top quark and its mass (35' + 10')

Monday, 27 August 2018 11:30 (45 minutes)

Presenter: HOANG, Andre (University of Vienna)

Session Classification: Plenary

Contribution ID: **45**   Type: **not specified**

Top quark measurements in CMS (35' + 10')

Monday, 27 August 2018 12:15 (45 minutes)

Presenter: ARNDT, Till Michael (Deutsches Elektronen-Synchrotron (DE))

Session Classification: Plenary

Contribution ID: **46** Type: **not specified**

Vector boson(s) and jet production in ATLAS (35' + 10')

Friday, 31 August 2018 12:15 (45 minutes)

Presenter: RUIZ MARTINEZ, Arantxa (Univ. of Valencia and CSIC (ES))

Session Classification: Plenary

Contribution ID: **47** Type: **not specified**

Farewell

Friday, 31 August 2018 13:00 (5 minutes)

Session Classification: Plenary

Contribution ID: 48   Type: **not specified**

Production of Higgs bosons with large transverse momentum

Monday, 27 August 2018 17:16 (18 minutes)

In this talk I will present our results on the Higgs plus jet production at the large transverse momentum, that is, above the top mass threshold. In particular, it will be shown how corresponding two-loop amplitudes were computed in approximation of nearly massless top quarks.

Primary authors: KUDASHKIN, Kirill (Karlsruhe Institute of Technology (KIT)); Dr WEVER, Christopher (KIT IKP); Prof. MELNIKOV, Kirill (TTP KIT); Dr LINDERT, Jonas (University of Durham (GB))

Presenter: KUDASHKIN, Kirill (Karlsruhe Institute of Technology (KIT))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **49**   Type: **not specified**

Direct space resummation for Higgs and Drell-Yan at N3LL

Tuesday, 28 August 2018 14:52 (17 minutes)

We present a direct space resummation formalism for colour singlet production in hadronic collisions. We focus on N3LL results for Higgs boson production in gluon-gluon fusion as well as results for Drell-Yan production, we show predictions with phenomenological cuts matched to NNLO fixed-order predictions.

Primary author: Mr BIZON, Wojciech (University of Oxford (GB))

Co-authors: MONNI, Pier Francesco (CERN); RE, Emanuele (CERN); TORRIELLI, Paolo; ROTTOLI, Luca (University of Oxford)

Presenter: Mr BIZON, Wojciech (University of Oxford (GB))

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **50**   Type: **not specified**

Double parton scattering: status of theory

Monday, 27 August 2018 14:30 (30 minutes)

I review the theory status of double parton scattering, with emhasis on higher-order raditative corrections.

Primary author: DIEHL, Markus (DESY)

Presenter: DIEHL, Markus (DESY)

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **51** Type: **not specified**

Determination of the strong coupling constant from inclusive jet cross section data from multiple experiments

Tuesday, 28 August 2018 15:35 (25 minutes)

https://arxiv.org/abs/1712.00480

Primary authors: BRITZGER, Daniel (Ruprecht Karls Universitaet Heidelberg (DE)); RABBERTZ, Klaus (KIT - Karlsruhe Institute of Technology (DE)); SAVOIU, Daniel (KIT - Karlsruhe Institute of Technology (DE)); SIEBER, Georg (KIT - Karlsruhe Institute of Technology (DE)); WOBISCH, Markus (Louisiana Tech University (US))

Presenter: SAVOIU, Daniel (KIT - Karlsruhe Institute of Technology (DE))

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **52**   Type: **not specified**

Tests of Perturbative QCD with Photon Final States at the ATLAS Experiment

Thursday, 30 August 2018 15:00 (25 minutes)

The production of prompt isolated photons at hadron colliders provides a stringent test of perturbative QCD and can be used to probe the gluon density function of the proton.

The ATLAS collaboration has performed numerous cross section measurements of prompt photon production, among which are a precise measurement of the production of isolated prompt photons in association with heavy flavor jets and a first measurement of the production cross-section of tri-photon final states at a center of mass energy of 8 TeV, as well as a photon plus jet cross section measurement at 13 TeV. If available, a measurement of diphotons in association with jets and a ratio of photon cross sections between 8 and 13 TeV will also be presented. The results are compared with state-of-the-art theory predictions, indicating several interesting discrepancies.

Presenter: CUETO GOMEZ, Ana Rosario (Universidad Autonoma de Madrid (ES))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **53**   Type: **not specified**

New Results on Z Boson Production with the ATLAS Detector

Thursday, 30 August 2018 15:30 (25 minutes)

Precision measurements of the Drell-Yan production of Z bosons at the LHC provide a benchmark of our understanding of perturbative QCD and electroweak processes and probe the proton structure in a unique way.

ATLAS performed a measurement of the effective leptonic weak mixing angle using electron and muon pairs from Z boson decay at a center of mass energy of 8 TeV. It consists of a set of measurements of the angular coefficient most sensitive to the weak mixing angle, binned in dilepton mass and rapidity reducing PDF uncertainties on the measurement.

In order to test the electroweak sector with single Z boson final states, ATLAS has published a first measurement of the tau-polarization in Z events as well as the cross-section of the electroweak production of Z bosons at 13 TeV. These results will be presented and discussed.

Presenter: WAGNER, Peter (University of Bonn (DE))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **54**   Type: **not specified**

Tests of the Gauge Structure of the Electroweak Sector with ATLAS

Monday, 27 August 2018 17:00 (25 minutes)

Measurements of the cross sections of the production of two or three electroweak gauge bosons at the LHC constitute stringent tests of the electroweak sector of the Standard Model and provide a model-independent means to search for new physics at the TeV scale. Such studies can be complemented by measurements of vector boson fusion or vector boson scattering processes with one or two gauge boson in association with two jets at high invariant mass, respectively. The ATLAS collaboration has performed detailed measurements of integrated and/or differential cross sections of the such processes at centre-of-mass energies of 8 and 13 TeV. In this talk, we will highlight the most recent results available, also focusing on the QCD modelling aspects of the measurements.

Presenter: CRANE, Jonathan (University of Manchester (GB))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **55**   Type: **not specified**

ATLAS recent results on production, spectroscopy and exotica in Quarkonia and Heavy Flavour

Heavy quark spectroscopy and exotic states are studied with the ATLAS detector, mainly through final states containing muon pairs from J/psi decays. This talk will summarise recent results from ATLAS, including production of quarkonium and heavy flavour, searches for exotic states and measurements of decay properties in open beauty production.

Primary author: ATLAS COLLABORATION

Presenter: ATLAS COLLABORATION

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **56**   Type: **not specified**

Top quark production cross-section measurements

Monday, 27 August 2018 14:30 (25 minutes)

Measurements of the inclusive and differential cross-sections for top-quark pair and single top production cross sections in proton-proton collisions with the ATLAS detector at the Large Hadron Collider are presented at center-of-mass energies of 8 TeV and 13 TeV. The inclusive measurements reach high precision and are compared to the best available theoretical calculations. These measurements, including results using boosted tops, probe our understanding of top-pair production in the TeV regime. Measurements of the properties of the Wtb vertex in single top-quark production allow to set limits on anomalous couplings. All measurements are compared to state-of-the-art theoretical calculations.

Presenter: ZOCH, Knut (Georg August Universitaet Goettingen (DE))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **57** Type: **not specified**

Top quark properties and mass measurements with the ATLAS detector

Tuesday, 28 August 2018 17:00 (25 minutes)

The top quark is unique among the known quarks in that it decays before it has an opportunity to form hadronic bound states. This makes measurements of its properties particularly interesting as one can access directly the properties of a bare quark. The latest measurements of these properties with the ATLAS detector at the LHC are presented using 8 TeV and 13 TeV data. Limits on the rate of flavour changing neutral currents in the production or decay of the top quark are also reported. The production of top-quark pairs in association with W and Z bosons and with photons are also presented. These process are all compared to the best available theoretical calculations. The latest ATLAS measurements of the top quark mass in lepton+jets, dilepton, and all-hadronic final states are also reported. In addition, measurements aiming to measure the mass in a well-defined scheme are presented.

Presenter: DE VASCONCELOS CORGA, Kevin (Centre National de la Recherche Scientifique (FR))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **61**   Type: **not specified**

Searches for non-SM Higgs bosons and for BSM decays of the Higgs boson at the ATLAS experiment

Tuesday, 28 August 2018 17:16 (18 minutes)

Several theories beyond the Standard Model predict the existence of additional neutral or charged Higgs particles, as well as decays of the Higgs boson that are either forbidden or strongly suppressed in the SM.Results from selected recent searches for additional Higgs bosons in different production processes and decay modes, and for BSM decays of the 125 GeV-Higgs boson will be presented.

Presenter: KLIMEK, Pawel Jan (Northern Illinois University (US))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **62**   Type: **not specified**

Measurements of elastic pp interactions and exclusive production with the ATLAS detector

The total pp cross section is a fundamental observable at the LHC. It can be derived from the measurement of the elastic cross section, using the optical theorem. Measurements of the elastic proton-proton cross section were performed at a center-of-mass energy of 8 TeV at various settings of the beam optics using the ALFA detector.

The ALFA detector is also used to tag forward protons in order to enrich the exclusive diffractive production of pion pairs for first cross section measurements of this process at center-of-mass energies of 7 and 8 TeV.

In the absence of forward proton tagging, exclusive processes can be distinguished in the central part of the ATLAS detector exploiting the absence of charged particles reconstructed in the inner tracking detector.

If available, the talk will also cover the study of the exclusive pion production at 7 and 8 TeV, the total cross section and rho determination from elastic scattering, as well as an inclusive single diffractive study at 8 TeV.

Primary author: ATLAS COLLABORATION

Presenter: ATLAS COLLABORATION

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **63**   Type: **not specified**

Drell-Yan measurements and PDFs

Thursday, 30 August 2018 15:00 (30 minutes)

The talk should cover W, Z/gamma* measurements sensitive to PDFs, as well as measurements of EW observables which are affected by significant PDF uncertainties (sin2thetaW, W mass).

Presenter: RIZVI, Eram Syed (Queen Mary, University of London)

Session Classification: PDFs, ⍺$_s$ and soft QCD

Track Classification: PDFs, ⍺$_s$ and soft QCD

Contribution ID: **64**   Type: **not specified**

MC tunes for Run 2 of the LHC and beyond (HL-LHC)

Monday, 27 August 2018 16:50 (17 minutes)

Abstract will be available shortly. The talk has been suggested by the organizer
ATLAS + CMS.
The content of this talk is related to the activities of one the CMS groups (Generator, Forward, SM, Top) and ATLAS groups (PMG, SM, TOP, Forward).

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

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **65**   Type: **not specified**

Effects of parton shower and underlying event modelling in Higgs measurements and searches

Monday, 27 August 2018 16:30 (17 minutes)

A number of Higgs measurements and searches for new phenomena in the Higgs sector rely on identification or vetos of particle jets with fairly low transverse momentum in the range of 20-30 GeV. In these cases uncertainties from the modelling of the parton shower and the underlying event can be sizeable. This talk will give an overview of how these uncertainties enter in several analyses.

Presenter: SOUSA, Mario Jose (Shandong University (CN))

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **66** Type: **not specified**

A determination of the strong coupling constant from a global QCD analysis

Thursday, 30 August 2018 17:00 (30 minutes)

I present the recent determination of αs performed by the NNPDF collaboration. I particularly discuss the novel methodology adopted in the fit, as well as the breakdown of the uncertainties.

Primary author: KASSABOV ZAHARIEVA, Zahari Dimitrov (University of Cambridge (GB))

Presenter: KASSABOV ZAHARIEVA, Zahari Dimitrov (University of Cambridge (GB))

Session Classification: PDFs, ⍺$_s$ and soft QCD

Track Classification: PDFs, ⍺$_s$ and soft QCD

Contribution ID: **67**   Type: **not specified**

Hard Photons in Hadroproduction of Top Quarks with Realistic Final States

Tuesday, 28 August 2018 17:30 (25 minutes)

We present a complete description of top quark pair production in association with a hard photon in the dilepton channel. Our calculation is accurate to NLO in QCD. It is based on matrix elements for e+νeμ−ν⁻μbb⁻γ production and includes all resonant and non-resonant diagrams, interferences, and off-shell effects of the top quarks and the W gauge bosons. This calculation constitutes the first full computation for top quark pair production with a final state photon in hadronic collisions at NLO in QCD. Numerical results for total and differential cross sections are presented for the LHC at a centre-of-mass energy of s√=13 TeV. For some new physics observables we observe shape distortions of more than 100%. In addition, we confirm that the size of the top quark off-shell effects for the total cross section is consistent with the expected uncertainties of the narrow-width-approximation. Triggered by ongoing experimental analyses, we also report on the cross section ratio to the pp→e+νeμ−ν⁻μbb⁻ process. Not only is the ratio more stable against radiative corrections but it also has reduced scale dependence as compared to the pp→e+νeμ−ν⁻μbb⁻γ cross section alone. Thus, it represents an interesting observable to probe new physics at the LHC.

Primary authors: BEVILACQUA, Giuseppe; HARTANTO, Heribertus Bayu (Durham University); WOREK, Malgorzata Maria (Rheinisch Westfaelische Tech. Hoch. (DE)); Dr KRAUS, Manfred (HU Berlin); WEBER, Torsten (RWTH Aachen University)

Presenter: WEBER, Torsten (RWTH Aachen University)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **68**   Type: **not specified**

Parton distributions from the collider data

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

Results of the QCD analysis of a variety of the hard-scattering data is overviewed with a particular focus on determination of the quark distributions in the nucleon. A potential of the recent precise data collected at the LHC for the problem of parton species disentangling is discussed and compared to the impact of the low-energy fixed-target data. Finally, remaining challenges and potential improvements in the field are outlined.

Primary author: ALEKHIN, Serguei (State Res.Center of Russian Feder. Inst.f.High Energy Phys. (IFVE))

Co-authors: BLUEMLEIN, Johannes (DESY); PETTI, Roberto (University of South Carolina (US)); MOCH, S. (UHH); KULAGIN, Sergey (INR (Moscow))

Presenter: ALEKHIN, Serguei (State Res.Center of Russian Feder. Inst.f.High Energy Phys. (IFVE))

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **69**   Type: **not specified**

Spectroscopy and decay widths of pseudoscalar and vector charmonium and bottomonium within the applications of Bethe - Salpeter equation

In this study, we calculate the mass spectrum, weak decay constants, two photon decay widths, and two gluon decay widths of ground (1S), and radially excited (2S, 3S, 4S) states of pseudoscalar charmoniuum and bottomonium such as η_cand η_b, as well as the mass spectrum, leptonic decay constants and radiative decay widths of ground state (1S) and excited (2S, 1D, 3S, 2D, 4S,3D, 5S, 5D) states of vector charmonium and bottomonium such as J/ψ, and Y using the formulation of Bethe-Salpeter equation under covariant Instantaneous Ansatz (CIA). Our results are in good agreement with data (where ever available) and other models. In this framework, from the beginning, we employ a 4×4 representation for two-body ($Q\bar{Q}$) BS amplitude for calculating both the mass spectra as well as the transition amplitudes. However, the price we have to pay is to solve a coupled set of equations for both pseudoscalar and vector quarkonia, which we have explicitly shown get decoupled in the heavy-quark approximation, leading to mass spectral equation with analytical solutions for both masses, as well as eigenfunctions for all the above states, in an approximate harmonic oscillator basis. The analytical forms of eigenfunctions for ground and excited states so obtained are used to evaluate the transition amplitudes for different processes in contrast purely numerical approaches used for solving the coupled Salpeter equations found in the literatures so far.

Primary author: Dr NEGASH, Hluf (Samara University)

Co-author: Prof. SHASHANK, Bhatnagar (Chandigarh University)

Presenter: Dr NEGASH, Hluf (Samara University)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **70**   Type: **not specified**

Jet energy scale and jet substructure performance in CMS

Tuesday, 28 August 2018 17:30 (25 minutes)

Jets are the experimental signature of energetic quarks and gluons produced in high energy processes. A detailed understanding of both the energy scale and the transverse momentum resolution of jets is of crucial importance for the analysis of perturbative QCD processes. In addition, the substructure, shape and mass of jets is an important tool to separate and study quark and gluon initiated jets as well as jets initiated by highly boosted W, Z, Higgs bosons and top quarks decaying to quarks. In this talk, we present the measurements of CMS jet energy scale and resolution, as well as the performance of jet substructure tagging algorithms using the data sample collected in proton-proton collisions at a center-of-mass energy of 13 TeV.

Presenter: AGGLETON, Robin Cameron (Hamburg University (DE))

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **71**   Type: **not specified**

Systematic approximation of multi-scale Feynman integrals

Monday, 27 August 2018 15:30 (25 minutes)

Abstract: An algorithm for the systematic analytical approximation of multi-scale Feynman integrals will be discussed. The algorithm produces algebraic expressions as functions of the kinematical parameters and mass scales appearing in the Feynman integrals, allowing for fast numerical evaluation. The results are valid in all kinematical regions, both above and below thresholds, up to in principle arbitrary orders in the dimensional regulator. The scope of the algorithm will be demonstrated by presenting results for selected two-loop three-point and four-point integrals with an internal mass scale that appear in the two-loop amplitudes for Higgs+jet production.

Primary author: Mr HULME, Daniel (UZH)

Presenter: Mr HULME, Daniel (UZH)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **72**   Type: **not specified**

The Lund Jet Plane

Thursday, 30 August 2018 14:30 (25 minutes)

Lund diagrams, a representation of the phase space within jets, have long been used in discussing parton showers and resummations. I will point out that they can also serve as a powerful tool for experimentally characterising the radiation pattern within jets. I will briefly comment on some of their analytical properties and highlight their scope for constraining Monte Carlo simulations. I will examine the use of the Lund plane for boosted electroweak boson tagging, which when used as an input to deep-learning methods yields high performance. Furthermore, much of that performance can be reproduced by using the Lund plane as an input to simpler log-likelihood type discriminators. This suggests a potential for unique insight and experimental validation of the features being used by machine-learning approaches. In the context of this discussion, I will also highlight the importance of accounting for detector effects when considering the performance of machine-learning approaches.

Primary author: DREYER, Frederic Alexandre (MIT)

Presenter: DREYER, Frederic Alexandre (MIT)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **73**   Type: **not specified**

Groomed jet substructure observables for inclusive jet production

Tuesday, 28 August 2018 17:00 (25 minutes)

The phenomenology of highly energetic jets and their substructure plays an important role for the physics program at the LHC. In recent years various grooming techniques have been proposed that need to be included consistently in perturbative calculations. Within Soft Collinear Effective Theory (SCET) we establish factorization theorems for jet substructure observables measured on an inclusive jet sample. The developed effective field theory framework allows the resummation of large logarithmic corrections to next-to-leading logarithmic (NLL) accuracy and a consistent treatment of non-perturbative effects. For example, we consider the jet mass distribution with and without grooming. We present numerical results and compare to the available data from the LHC.

Primary author: RINGER, Felix (Lawrence Berkeley National Laboratory)

Presenter: RINGER, Felix (Lawrence Berkeley National Laboratory)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **74**   Type: **not specified**

Precise predictions for diboson processes

Monday, 27 August 2018 16:30 (25 minutes)

I will review recent theory developments for diboson production at the LHC within the puclicly available code MATRIX: With the two lepton plus two neutrino channels, which mix ZZ and WW production, NNLO corrections have been completed to all experimentally relevant leptonic final states for diboson processes. NLO corrections to the loop-induced gg channel are formally of N3LO accuracy, but constitute an important contribution to the (fiducial) diboson rates in certain cases. Finally, the inclusion of NNLO accuracy in fully flexible hadron level events (NNLOPS) was recently achieved for a diboson process, namely WW production, which will be discussed in detail.

Primary author: WIESEMANN, Marius (CERN)

Presenter: WIESEMANN, Marius (CERN)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **75**   Type: **not specified**

Next-to-next-to-leading order N-jettiness soft function for tW production at the LHC

We calculate the N-jettiness soft function for tW production up to next-to-next-to-leading order in QCD, which is an important ingredient of the N-jettiness subtraction method for predicting the differential cross sections of massive coloured particle productions. We also compare the results with the predictions from renormalization group equations controlled by the soft anomalous dimension.

Primary author: WANG, Jian

Co-author: LI, Haitao (Los Alamos National Laboratory)

Presenter: WANG, Jian

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **76**   Type: **not specified**

NLO predictions for $t\bar{t} + b\bar{b}$ production in association with a light-jet at the LHC

Monday, 27 August 2018 15:00 (25 minutes)

Precise measurements of Higgs boson production in association with top-quark pairs allow for constraints on the top-quark Yukawa coupling, which in turn is crucial to fully characterise the scalar sector of the Standard Model and could also open a window on Beyond-the-Standard-Model interactions. At the Large Hadron Collider, searches for $t\bar{t}H$ production in the dominant $H \to b\bar{b}$ channel are plagued by a large QCD background, which is dominated by $t\bar{t}$ production in association with a $b\bar{b}$ pair. The detailed understanding of this multi-particle and multi-scale background process is of crucial importance for the sensitivity of $t\bar{t}H(\to b\bar{b})$ analyses.

Motivated by the fact that state-of-the-art Monte Carlo simulations for this background suffer from uncertainties related to the modeling of extra light-jet radiation, I present a study for $t\bar{t}b\bar{b}$+jet production at NLO QCD. The focus is on effects and uncertainties in observables relevant for $t\bar{t}H(b\bar{b})$ analyses.

At the technical level this calculation represents the first application of a new on-the-fly integrand reduction algorithm implemented in OpenLoops2.

Primary author: BUCCIONI, Federico (University of Zurich)

Co-author: POZZORINI, Stefano Augusto (Universitaet Zuerich (CH))

Presenter: BUCCIONI, Federico (University of Zurich)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **77** Type: **not specified**

NNLO QCD predictions for dijet production in diffractive DIS

Monday, 27 August 2018 15:30 (30 minutes)

Calculations for dijet production in diffractive deep-inelastic scattering (DIS) at next-to-next-to-leading order accuracy (NNLO) are presented. The calculations are based on the antenna subtraction formalism and the hard coefficients are convoluted with currently available PDFs for diffractive scattering (DPDFs).

The NNLO predictions are compared to a large number of available measurements and different observables. Detailed studies on the DPDF and scale dependencies are presented.

Primary authors: BRITZGER, Daniel (Max-Planck-Institut für Physik München); ZLEBCIK, Radek (Deutsches Elektronen-Synchrotron (DE)); GEHRMANN, Thomas (Univ. Zurich); HUSS, Alexander Yohei (CERN); CURRIE, James (University of Durham); NIEHUES, Jan (University of Zurich)

Presenter: BRITZGER, Daniel (Max-Planck-Institut für Physik München)

Session Classification: PDFs, ⍺$_s$ and soft QCD

Track Classification: PDFs, ⍺$_s$ and soft QCD

Contribution ID: **78**   Type: **not specified**

N3LO QCD DIS Single-jet production and NNLO QCD eˆ+eˆ- event orientation with NNLOJET

Tuesday, 28 August 2018 16:30 (25 minutes)

In this talk, recent results on the calculation of fully differential single-jet production in neutral current deep inelastic scattering at next-to-next-to-next-to leading order (N3LO) in the strong coupling are presented. The results are obtained by the combination of antenna subtraction at next-to-next-to leading order (NNLO) with the method of projection to born. Details of the combination of the two approaches will be discussed. Phenomenological results on NNLO QCD predictions for event-orientations in eˆ+eˆ- - annihilation will be also shown.

Primary author: NIEHUES, Jan

Presenter: NIEHUES, Jan

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **79**   Type: **not specified**

Differential Equations for Feynman Integrals

Monday, 27 August 2018 15:00 (25 minutes)

The calculation of Feynman Integrals is one of bottlenecks for precision calculations at Next-to-Next-to-leading order and beyond. Differential Equations have proven to be a powerful tool to relieve this bottleneck and have seen a rapid development in the last years. In this talk I will review these recent developments especially focusing on the so-called canonical form. I will present the Magnus algorithm as a tool to find these special forms. The presented techniques are then applied to several analytic calculations including part of the integrals relevant for Higgs+Jet production at three loops and for top pair production at two-loops.

Primary author: SCHUBERT, Ulrich (Argonne National Laboratory)

Presenter: SCHUBERT, Ulrich (Argonne National Laboratory)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **80**   Type: **not specified**

Precision determination of the Wtb coupling in single top production

Thursday, 30 August 2018 16:30 (25 minutes)

We present our calculation of next-to-leading order QCD effects in single top production for a precision determination of the Wtb coupling. The calculation is performed analytically with an off-shell top quark and includes relevant operators from the Standard Model Effective Field Theory (SMEFT) that modify the Wtb coupling also at next-to-leading order in QCD. We discuss the phenomenological importance and put our calculation into the context of current studies.

Primary authors: NEUMANN, Tobias (Illinois Tech / Fermi National Accelerator Laboratory); SULLIVAN, Zack (Illinois Institute of Technology)

Presenter: NEUMANN, Tobias (Illinois Tech / Fermi National Accelerator Laboratory)

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **81**   Type: **not specified**

Massive bottom quark effect in Drell-Yan P_T spectrum

Thursday, 30 August 2018 16:30 (17 minutes)

We study the transverse momentum spectrum for Drell-Yan production including the bottom mass effect. The pt-distribution of DY or Z boson is very important observable at the LHC, particularly to the ratio of W boson and Z boson spectrum to precisely measure of the W boson mass. The presence of an extra mass scale namely the bottom mass along with the hard scale and the pt-scale makes it very difficult to study within QCD. The three different mass scales give rise to several mass hierarchies leading to large logarithms which needs to be resummed at all orders to get a meaningful result. Moreover the different regions have to be properly matched to get a smooth distribution avoiding double counting or gaps. For these kind of problem, effective theories show a better grasp onto the problem. Using SCET based factorisation we resum these large logarithms in a systematic way upto NNLLp accuracy. We discuss different theoretical issues namely order counting, rapidity divergences etc. We identify two different kind of contributions namely the primary effect where bottom quark initiates the hard process and the secondary effect where bottom quark contributes through loop. Both these contributions are included into our calculation. Finally we present properly matched pt distribution which will be useful at the LHC to the measurement of Z boson and W boson properties.

Primary author: GOUTAM, Das (DESY Hamburg)

Co-authors: TACKMANN, Frank (Deutsches Elektronen-Synchrotron (DE)); BAGNASCHI, Emanuele Angelo (DESY Hamburg)

Presenter: GOUTAM, Das (DESY Hamburg)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **82**   Type: **not specified**

Role of the Z polarization in the H > bb measurement.

Monday, 27 August 2018 17:39 (18 minutes)

In this talk I show that the Z boson polarization has relevant information to distinguish the signal $pp \rightarrow ZH$, $H \rightarrow b\bar{b}$ from the dominant background $Zb\bar{b}$, which is part of the $\mathcal{O}(\alpha_s^2)$ correction to the Drell-Yan Z production, and can help us to finally observe the largest Higgs boson branching ratio.

Primary authors: NAKAMURA, Junya (Universität Tübingen); GONÇALVES, Dorival (University of Pittsburgh)

Presenter: NAKAMURA, Junya (Universität Tübingen)

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **83**   Type: **not specified**

Recent QCD results from the xFitter project

Monday, 27 August 2018 15:00 (30 minutes)

We present the xFitter project which provides an open-source software framework
for the determination of the proton's parton distribution functions and for the interpretation of
the physics analyses in the context of Quantum Chromodynamics.
The project has been used recently for a number of analyses performed by the LHC collaborations
and theory community, which are summarised briefly. The xFitter developer's team also performed
several studies in the last year including estimation of the impact of heavy quark matching scales
and next to leading log high-energy resummation in the PDF fits, which are presented in more
details.

Primary authors: GLAZOV, Alexander (Deutsches Elektronen-Synchrotron (DE)); ZENAIEV, Oleksandr

Presenter: GLAZOV, Alexander (Deutsches Elektronen-Synchrotron (DE))

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **84**   Type: **not specified**

Top quark and jets measurements sensitive to PDFs

Thursday, 30 August 2018 15:30 (30 minutes)

The talk will cover measurements and QCD analyses of inclusive and differential
top quark pairs and single top production, and of jets production, from ATLAS, CMS and LHCb.

Presenter: CHATTERJEE, Suman (Tata Inst. of Fundamental Research (IN))

Session Classification: PDFs, ⍺$_s$ and soft QCD

Track Classification: PDFs, ⍺$_s$ and soft QCD

Contribution ID: **85**   Type: **not specified**

Underlying event measurements at the LHC

Latest results from Underlying event measurements from ATLAS and CMS are presented.

Primary author: CMS COLLABORATION

Presenter: CMS COLLABORATION

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **86**   Type: **not specified**

Moments of PDFs from Lattice QCD

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

Mellin moments of PDFs are calculable as expectation values of local operators within external states, using Lattice QCD. With sufficiently small statistical and systematic uncertainties, these provide information that will be complementary to parametrizations obtained from global fits to experimental data. I will present such lattice results.

Primary author: Prof. BALI, Gunnar (Universität Regensburg)

Presenter: Prof. BALI, Gunnar (Universität Regensburg)

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: 87   Type: **not specified**

Determination of $\alpha_s(m_Z)$ from a fit of the Z-boson transverse momentum distribution measured by CDF to NNLO+NNLL predictions

Tuesday, 28 August 2018 15:15 (20 minutes)

The strong-coupling constant $\alpha_s(m_Z)$ is measured from the transverse momentum distribution of Z bosons measured at $\sqrt{s} = 1.96$ TeV with the CDF experiment, using predictions based on qt resummation at NNLO+NNLL, as implemented in the DYTURBO program. The measurement is performed through a simultaneous fit of $\alpha_s(m_Z)$, PDFs, and the non-perturbative Sudakov form factor.

Primary authors: CAMARDA, Stefano (Johannes Gutenberg Universitaet Mainz (DE)); SCHOTT, Matthias (CERN / University of Mainz)

Presenter: CAMARDA, Stefano (Johannes Gutenberg Universitaet Mainz (DE))

Session Classification: PDFs, ⍺s and soft QCD

Track Classification: PDFs, ⍺s and soft QCD

Contribution ID: **88**   Type: **not specified**

Top-quark pair production beyond NNLO

Tuesday, 28 August 2018 16:30 (25 minutes)

The total top-antitop production cross section at hadron colliders is one of the key observables of the Standard Model. Comparisons of LHC measurements with theoretical calculations are being used to determine the top-quark mass and the strong coupling and are included in global PDF fits. These applications are currently based on calculations at the next-to-next-to-leading order (NNLO) in QCD supplemented by soft-gluon resummation at the next-to-next-to-leading logarithmic order. In this talk I will present recent developments in computing the cross section beyond NNLO, which is necessary to keep up with the ever increasing experimental accuracy.

Primary author: PICLUM, Jan (University of Siegen)

Presenter: PICLUM, Jan (University of Siegen)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **91**   Type: **not specified**

CP-violation measurements in B->DX decays at LHCb

Measurements of CP violation are a core part of the LHCb physics programme and provide sensitivity to angles of the CKM matrix as well as probing our understanding of the differences between matter and antimatter. A summary of recent LHCb results are presented, including the time-dependent B0->Dpi analysis which profits from the largest flavour tagged sample analysed by LHCb, the world's first observation of the Bs->DKK channel and analysis of its Dalitz structure and the world's most precise (first) measurements of the CP asymmetry in B+ -> D(s)+D0 decays.

Primary author: MUELLER, Katharina (Universitaet Zuerich (CH))

Presenter: MUELLER, Katharina (Universitaet Zuerich (CH))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **92**   Type: **not specified**

Flavour Anomalies in Rare Decays at LHCb

Thursday, 30 August 2018 14:30 (25 minutes)

Rare decays are powerful probes for Physics beyond the Standard Model (SM), as new particles can have a large impact on physics observables. Recent results on lepton universality tests and measurements of branching fractions and angular distributions of rare b->sll decays have shown tensions with the SM predictions. The LHCb experiment is ideally suited for the study of the these flavour anomalies, due to its large acceptance, precise vertexing and powerful particle identification capabilities. The latest results from LHCb on the flavour anomalies will be presented and their interpretation will be discussed.

Presenter: LANGENBRUCH, Christoph Michael (Rheinisch Westfaelische Tech. Hoch. (DE))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **93**   Type: **not specified**

Theory input for VBS

Tuesday, 28 August 2018 14:53 (18 minutes)

In this talk, I review recent theoretical developments for VBS processes at the LHC.

Primary author: PELLEN, Mathieu (University Wuerzburg)

Presenter: PELLEN, Mathieu (University Wuerzburg)

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **94**   Type: **not specified**

CP Violation in pure hadronic three-body B meson decays

Thursday, 30 August 2018 15:30 (25 minutes)

The search for CP violation is a large part of the flavour programs at LHCb and the B factories, with pure hadronic decays as the key players. Three-body decays, which form a large part of the B meson branching fraction, contain much more information than two-body decays, because of their non-trivial kinematic structure. Recently, these decays were described using a QCD factorization framework similar to two-body decays, but with new non-perturbative inputs. I discuss a first study of CP violation in three-body B decays using this new framework.

Primary author: Dr VOS, Keri (Siegen University)

Presenter: Dr VOS, Keri (Siegen University)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **95** Type: **not specified**

Strong coupling constant extraction from high-multiplicity Z+jets observables

Tuesday, 28 August 2018 14:55 (20 minutes)

I will present a strong coupling constant extraction at next-to-leading order QCD accuracy using ATLAS Z+2,3,4 jets data. This is the first extraction using processes with a dependency on high powers of the coupling constant. The values of the strong coupling constant at the Z mass obtained are compatible with the world average and with uncertainties commensurate with other next-to-leading order extractions at hadron colliders.

Primary author: MAITRE, Daniel

Presenter: MAITRE, Daniel

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **96**   Type: **not specified**

Long-distance effects in B->K(*) l+ l-

Thursday, 30 August 2018 15:00 (25 minutes)

I will discuss recent developments regarding long-distance effects in B->K(*)l+ l- decays.
Precise knowledge of these effects is needed for the interpretation of the present anomaly seen in the experimental results. The approach I discuss relies on the analytic properties of the hadronic matrix elements. It combines the available theory information beyond the physical phase space with experimental data of hadronic decays B->K(*) psi. The results are predictions for the rare decay within the Standard Model and beyond.

Primary author: VAN DYK, Danny (TU München)

Presenter: VAN DYK, Danny (TU München)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **97**   Type: **not specified**

Exotic and Conventional Quarkonium Physics Prospects at Belle II

Thursday, 30 August 2018 17:30 (25 minutes)

The Belle II experiment, now operating at the KEK laboratory in Japan, is a substantial upgrade of both the Belle detector and the KEKB e^+e^- accelerator. It aims to collect 50 times more data than existing B-Factory samples. Belle II is uniquely capable to study the so-called "XYZ" particles: heavy exotic hadrons consisting of more than three quarks. First discovered by Belle, these now number in the dozens, and represent the emergence of a new category within quantum chromodynamics. This talk will present the capabilities of Belle II to explore both exotic and conventional quarkonium physics.

Presenter: SCAVINO, Bianca (Uni Mainz)

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: 98   Type: **not specified**

New Results on Vector Boson Scattering Processes with the ATLAS Detector

Tuesday, 28 August 2018 15:39 (18 minutes)

New Results on Vector Boson Scattering Processes with the ATLAS Detector

Measurements of the cross sections of the vector-boson scattering processes at the LHC constitute stringent tests of the electroweak sector of the Standard Model and provide a model-independent means to search for new physics at the TeV scale. The ATLAS collaboration observed the electroweak production of WZ and same-signed WW pairs in vector boson scattering processes at a center of mass energy of 13 TeV using the 2015+2016 data-sets. We present the corresponding analyses in detail and discuss the compatibility to theory predictions.

Presenter: XU, Wenhao (University of Michigan (US))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **99**   Type: **not specified**

QCD Issues in Searches for New Physics with the ATLAS Detector

Tuesday, 28 August 2018 17:39 (18 minutes)

QCD Issues in Searches for New Physics with the ATLAS Detector

The ATLAS experiment at the LHC has a broad search program covering a wide variety of models of physics beyond the Standard Model, from simplified models to UV complete models like supersymmetry. In many searches, the final states include one or more hadronic object, and QCD constitutes a crucial background, the control and understanding of which is critical for sensitivity to new physics. Searches make use of QCD scaling rules for background estimation, jet sub-structure for signal and background separation, and higher-order calculations and resummation for signal cross-sections. Additional complex QCD issues arise in searches for R-hadrons —hadrons that include long-lived supersymmetric particles —or other new colored particles. This talk summarizes recent search results from the ATLAS experiment, highlighting techniques and issues that most strongly interact with QCD.

Presenter: SAIMPERT, Matthias (Deutsches Elektronen-Synchrotron (DE))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **100**   Type: **not specified**

Next-to-leading power correction in particle scattering near threshold

Tuesday, 28 August 2018 17:36 (17 minutes)

I will discuss recent developments in the calculation of next-to-leading power corrections in Drell Yan and other electroweak annihilation processes.

Primary author: Dr VERNAZZA, Leonardo (Nikhef and University of Amsterdam)

Presenter: Dr VERNAZZA, Leonardo (Nikhef and University of Amsterdam)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **101**   Type: **not specified**

NLO corrections to Higgs boson pair production in a non-linear EFT

Tuesday, 28 August 2018 16:53 (18 minutes)

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Primary authors: HEINRICH, Gudrun (Max Planck Institute for Physics); BUCHALLA, Gerhard (LMU Munich); CELIS, Alejandro (Ludwig Maximilian University); Mr CAPOZI, Matteo (Max-Planck Institute for Physics); SCYBOZ, Ludovic Michel (Max-Planck-Institut fur Physik (DE))

Presenter: SCYBOZ, Ludovic Michel (Max-Planck-Institut fur Physik (DE))

Session Classification: EW, Higgs and BSM

Track Classification: EW, Higgs and BSM

Contribution ID: **102**   Type: **not specified**

Analytic calculation of multi-loop Feynman integrals

Monday, 27 August 2018 14:30 (25 minutes)

Multi-loop Feynman integrals represent an essential building block for the precision physics program at high-energy colliders and beyond. In my talk I will review recent developments concerning their evaluation with the method of differential equations, giving particular emphasis to the so-called canonical form and presenting some examples of phenomenological interest.

Primary author: DI VITA, Stefano (Università degli Studi e INFN Milano (IT))

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

Session Classification: Perturbative QCD, jets and substructure

Track Classification: Perturbative QCD, Jets and Substructure

Contribution ID: **103**   Type: **not specified**

Shower Variations and Tuning

Thursday, 30 August 2018 14:30 (17 minutes)

Presenter: SIODMOK, Andrzej Konrad (Polish Academy of Sciences (PL))

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **104**   Type: **not specified**

Parton Shower Cutoff and the Heavy Quark Mass Parameter

Thursday, 30 August 2018 14:52 (17 minutes)

Presenter: HOANG, Andre (University of Vienna)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **105** Type: **not specified**

PS vs Resummation

Thursday, 30 August 2018 15:14 (17 minutes)

Presenter: REICHELT, Daniel (Technische Universitaet Dresden (DE))

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **106**   Type: **not specified**

Colour Matrix Element Corrections

Tuesday, 28 August 2018 16:30 (17 minutes)

Presenter: SJODAHL, Malin (Lund University)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **107** Type: **not specified**

Beyond NLL

Tuesday, 28 August 2018 14:30 (17 minutes)

Presenter: DREYER, Frederic Alexandre (MIT)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **108** Type: **not specified**

Higgs

Tuesday, 28 August 2018 15:36 (17 minutes)

Presenter: MARZANI, Simone (Università di Genova and INFN Genova)

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **109**   Type: **not specified**

Non-global Logarithms beyond Leading Colour

Thursday, 30 August 2018 16:52 (17 minutes)

Presenter: DEANGELIS, Matthew

Session Classification: Monte Carlo and resummation

Track Classification: Monte Carlo and Resummation

Contribution ID: **110**   Type: **not specified**

ttH Theory

Session Classification: Heavy Quarks

Contribution ID: **111** Type: **not specified**

Associated top quark pair production with a Higgs boson: theoretical predictions

Monday, 27 August 2018 15:30 (25 minutes)

The investigation of the $pp \to t\bar{t}H$ process is among the highest priorities of the current LHC physics program. Correspondingly, improvements in precision with which theoretical predictions for this process are known are of central importance. In this talk the recent progress concerning theoretical predictions for the signal will be reviewed.

Primary author: KULESZA, Anna Katarzyna (Westfaelische Wilhelms-Universitaet Muenster (DE))

Presenter: KULESZA, Anna Katarzyna (Westfaelische Wilhelms-Universitaet Muenster (DE))

Session Classification: Heavy Quarks

Track Classification: Heavy Quarks

Contribution ID: **112**   Type: **not specified**

Herwig 7 Status and Prospects

Monday, 27 August 2018 14:30 (25 minutes)

Presenter: SIODMOK, Andrzej Konrad (Polish Academy of Sciences (PL))

Session Classification: Monte Carlo and resummation

Contribution ID: **113**   Type: **not specified**

Recent developments in the CTEQ-TEA global analysis

Thursday, 30 August 2018 17:30 (30 minutes)

We will talk about the recent progress in the CTEQ-TEA global analysis.

Primary authors: Dr DULAT, Sayipjamal (Xinjiang University);   Dr GAO, Jun (Shanghai Jiao--Tong University);   Dr GUZZI, Marco (Kennesaw State University);   Dr HOBBS, Timothy (Southern Methodist University);   Dr HOU, Tie-Jiun (Xinjiang University);   Dr HUSTON, Joey (Michigan State University);   Dr NADOLSKY, Pavel (Southern Methodist University);   Dr SCHMIDT, Carl (Michigan State University);   Dr STUMP, Daniel (Michigan State University);   Dr XIE, Keping (Southern Methodist University);   Dr YUAN, C.–P. (Michigan State University)

Presenter: Dr HOU, Tie-Jiun (Xinjiang University)

Session Classification: PDFs, α_s and soft QCD

Track Classification: PDFs, α_s and soft QCD

Contribution ID: **114**   Type: **not specified**

Measurements of the Higgs boson properties at the ATLAS experiment

Tuesday, 28 August 2018 14:30 (18 minutes)

After the discovery of the Higgs boson in summer 2012, the understanding its properties has been a high priority of the ATLAS physics program. Measurements of Higgs boson properties sensitive to its production processes, decay modes, kinematics, mass, and spin/CP properties based on pp collision data recorded at 13 TeV are presented. The analyses in several decay channels will be described and the results of the combination of different decay channels will be shown.

Presenter: GLAYSHER, Paul (DESY)

Session Classification: EW, Higgs and BSM