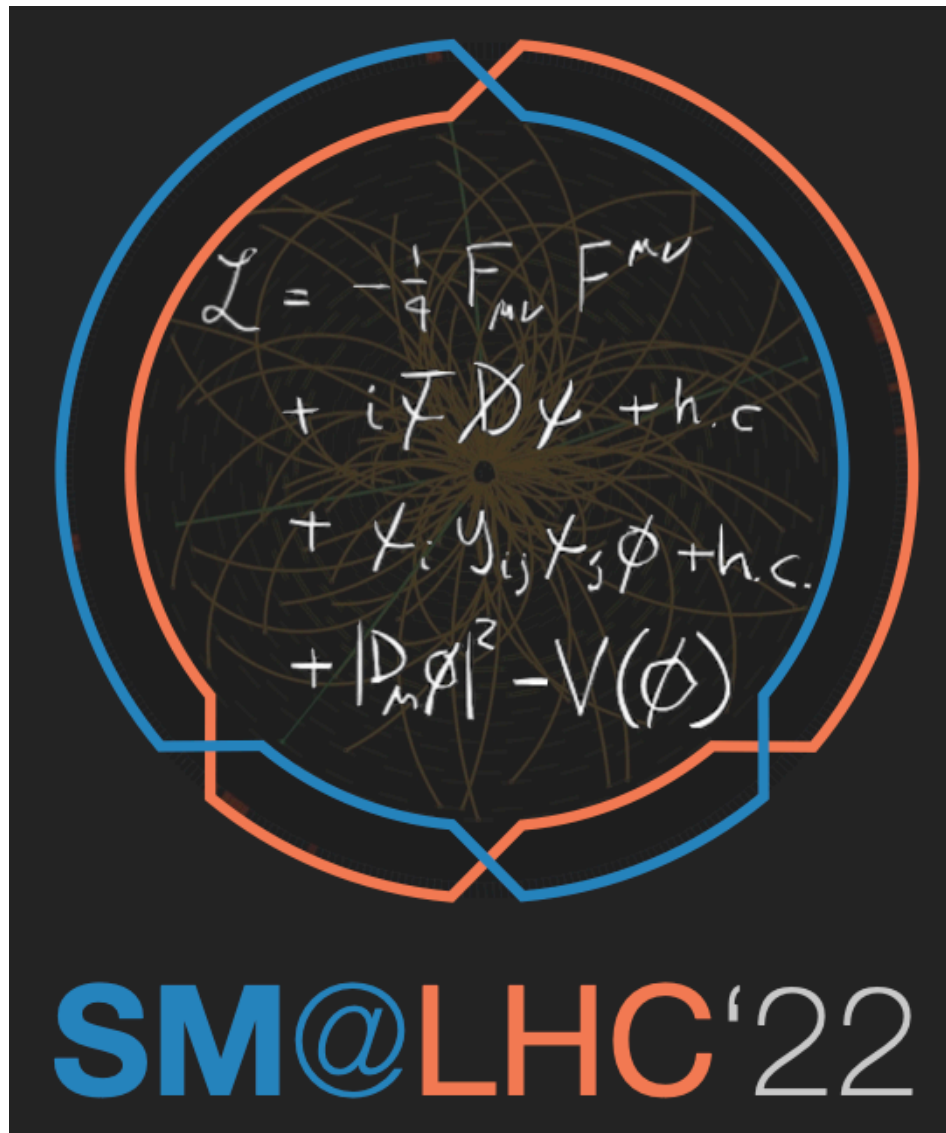


Standard Model at the LHC 2022



Report of Contributions

Contribution ID: **1**

Type: **not specified**

Welcome

Monday, 11 April 2022 12:20 (10 minutes)

Presenters: HUSS, Alexander Yohei (CERN); CARLI, Tancredi (CERN)

Contribution ID: 6

Type: **not specified**

Jet substructure variables in quark and gluon jets

Monday, 11 April 2022 12:30 (15 minutes)

Primary author: GONCERZ, Mateusz Jacek (Polish Academy of Sciences (PL))

Presenter: GONCERZ, Mateusz Jacek (Polish Academy of Sciences (PL))

Session Classification: QCD

Contribution ID: 7

Type: **not specified**

inclusive and di-jet production at 13 TeV

Monday, 11 April 2022 12:48 (15 minutes)

Primary authors: SAVOIU, Daniel (KIT); SAVOIU, Daniel (KIT - Karlsruhe Institute of Technology (DE))

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

Session Classification: QCD

Contribution ID: 8

Type: **not specified**

PDF4LHC21 benchmarking

Monday, 11 April 2022 13:06 (15 minutes)

Primary authors: HUSTON, Joey (Department of Physics and Astronomy); HUSTON, Joey (Michigan State University (US))

Presenters: HUSTON, Joey (Department of Physics and Astronomy); HUSTON, Joey (Michigan State University (US))

Session Classification: QCD

Contribution ID: 9

Type: **not specified**

PDF fits @ LHC

Monday, 11 April 2022 13:25 (15 minutes)

Primary author: CONROY, Eimear Isobel (University of Oxford (GB))

Presenter: CONROY, Eimear Isobel (University of Oxford (GB))

Session Classification: QCD

Contribution ID: **10**

Type: **not specified**

High precision observables in DY

Monday, 11 April 2022 14:15 (15 minutes)

Primary author: FREITAS, Ayres

Presenter: FREITAS, Ayres

Session Classification: Electroweak

Contribution ID: **11**

Type: **not specified**

Mixed EW-QCD corrections to W/Z production

Monday, 11 April 2022 14:33 (15 minutes)

Primary authors: VICINI, Alessandro (University of Milano); VICINI, Alessandro (Università degli Studi e INFN Milano (IT))

Presenters: VICINI, Alessandro (University of Milano); VICINI, Alessandro (Università degli Studi e INFN Milano (IT))

Session Classification: Electroweak

Contribution ID: 12

Type: **not specified**

Recent results on W mass and branching fraction

Monday, 11 April 2022 14:51 (15 minutes)

Primary author: XU, Menglin (University of Warwick (GB))

Presenter: XU, Menglin (University of Warwick (GB))

Session Classification: Electroweak

Contribution ID: 13

Type: **not specified**

Z invisible BR/DY AFB/forward Z and mass dependent pt

Monday, 11 April 2022 15:10 (15 minutes)

Primary author: AMRAM, Oz (Johns Hopkins University (US))

Presenter: AMRAM, Oz (Johns Hopkins University (US))

Session Classification: Electroweak

Contribution ID: 14

Type: **not specified**

Towards a global EFT analysis (LHC EFT)

Monday, 11 April 2022 16:00 (20 minutes)

Primary author: LOHWASSER, Kristin (University of Sheffield (GB))

Presenter: LOHWASSER, Kristin (University of Sheffield (GB))

Session Classification: EFT

Contribution ID: 15

Type: **not specified**

Global interpretation of Higgs, diboson, and top quark production & decay

Monday, 11 April 2022 16:25 (20 minutes)

Primary author: MADIGAN, Maeve

Presenter: MADIGAN, Maeve

Session Classification: EFT

Contribution ID: **16**

Type: **not specified**

CP-odd flavour-invariants in SMEFT

Monday, 11 April 2022 16:50 (20 minutes)

Primary author: BONNEFOY, Quentin (DESY)

Presenter: BONNEFOY, Quentin (DESY)

Session Classification: EFT

Contribution ID: 17

Type: **not specified**

Photons and Jets

Monday, 11 April 2022 17:30 (15 minutes)

Primary author: HÖFER, Marius (LMU Munich)

Presenter: HÖFER, Marius (LMU Munich)

Session Classification: QCD/EW

Contribution ID: **18**

Type: **not specified**

V+light jets

Monday, 11 April 2022 17:48 (15 minutes)

Primary author: MIJUSKOVIC, Jelena (University of Montenegro (ME))

Presenter: MIJUSKOVIC, Jelena (University of Montenegro (ME))

Session Classification: QCD/EW

Contribution ID: **19**

Type: **not specified**

EW corrections in PDFs

Monday, 11 April 2022 18:06 (15 minutes)

Primary author: SCHWAN, Christopher (Universität Würzburg)

Presenter: SCHWAN, Christopher (Universität Würzburg)

Session Classification: QCD/EW

Contribution ID: 20

Type: **not specified**

AFB vs AW - impact on PDFs, SM parameters and BSM searches

Monday, 11 April 2022 18:24 (15 minutes)

Primary authors: FIASCHI, Juri (University of Southampton); FIASCHI, Juri (Westfälische Wilhelms-Universität Münster)

Presenters: FIASCHI, Juri (University of Southampton); FIASCHI, Juri (Westfälische Wilhelms-Universität Münster)

Session Classification: QCD/EW

Contribution ID: 21

Type: **not specified**

Higgs differential cross sections

Tuesday, 12 April 2022 12:30 (20 minutes)

Primary author: WIESEMANN, Marius (Max Planck Society (DE))

Presenter: WIESEMANN, Marius (Max Planck Society (DE))

Session Classification: Higgs

Contribution ID: 22

Type: **not specified**

State of the art of SM Higgs measurements

Tuesday, 12 April 2022 12:55 (25 minutes)

Primary author: SCANLON, Timothy Paul (UCL)

Presenter: SCANLON, Timothy Paul (UCL)

Session Classification: Higgs

Contribution ID: 23

Type: **not specified**

VBF/VBS observations/limitations

Tuesday, 12 April 2022 13:25 (15 minutes)

Primary authors: MAGHERINI, Matteo (università degli studi di Perugia); MAGHERINI, Matteo (Universita e INFN, Perugia (IT))

Presenters: MAGHERINI, Matteo (università degli studi di Perugia); MAGHERINI, Matteo (Universita e INFN, Perugia (IT))

Session Classification: Higgs

Contribution ID: 24

Type: **not specified**

On the modeling uncertainties of $t\bar{t}W$ multi-lepton signatures

Tuesday, 12 April 2022 14:15 (20 minutes)

Primary authors: FEBRES CORDERO, Fernando (Florida State University); FEBRES CORDERO, Fernando (Florida State University)

Presenters: FEBRES CORDERO, Fernando (Florida State University); FEBRES CORDERO, Fernando (Florida State University)

Session Classification: Top

Contribution ID: 25

Type: **not specified**

Most recent single top measurements at the LHC

Tuesday, 12 April 2022 14:40 (20 minutes)

Primary author: DELL'ASTA, Lidia (Università degli Studi e INFN Milano (IT))

Presenter: DELL'ASTA, Lidia (Università degli Studi e INFN Milano (IT))

Session Classification: Top

Contribution ID: 26

Type: **not specified**

Most recent ttV measurements at the LHC

Tuesday, 12 April 2022 15:05 (20 minutes)

Primary author: TRAN, Tu Thong (Universite Catholique de Louvain (UCL) (BE))

Presenter: TRAN, Tu Thong (Universite Catholique de Louvain (UCL) (BE))

Session Classification: Top

Contribution ID: 27

Type: **not specified**

Lepton flavour universality tests

Tuesday, 12 April 2022 16:00 (17 minutes)

Primary author: REISS, Florian (University of Manchester (GB))

Presenter: REISS, Florian (University of Manchester (GB))

Session Classification: Heavy Flavour

Contribution ID: **28**

Type: **not specified**

rare heavy flavour decays

Tuesday, 12 April 2022 16:20 (17 minutes)

Primary author: ARUTA, Caterina (Universita e INFN, Bari (IT))

Presenter: ARUTA, Caterina (Universita e INFN, Bari (IT))

Session Classification: Heavy Flavour

Contribution ID: 29

Type: **not specified**

Predictions for $R(D^*)$, BF, angular observables

Tuesday, 12 April 2022 16:40 (20 minutes)

Primary author: STANGL, Peter (University of Bern)

Presenter: STANGL, Peter (University of Bern)

Session Classification: Heavy Flavour

Contribution ID: **30**

Type: **not specified**

YSF 1

Session Classification: YSF

Contribution ID: **31**

Type: **not specified**

YSF 2

Session Classification: YSF

Contribution ID: **32**

Type: **not specified**

YSF 3

Session Classification: YSF

Contribution ID: **33**

Type: **not specified**

YSF 4

Session Classification: YSF

Contribution ID: **34**

Type: **not specified**

YSF 5

Session Classification: YSF

Contribution ID: 35

Type: **not specified**

YSF 6

Session Classification: YSF

Contribution ID: **36**

Type: **not specified**

YSF 7

Session Classification: YSF

Contribution ID: 37

Type: **not specified**

B-hadrons in top-quark pair production at NNLO QCD

Wednesday, 13 April 2022 12:30 (20 minutes)

Primary author: CZAKON, Michal Wiktor (Rheinisch Westfaelische Tech. Hoch. (DE))

Presenter: CZAKON, Michal Wiktor (Rheinisch Westfaelische Tech. Hoch. (DE))

Session Classification: Top

Contribution ID: **38**

Type: **not specified**

Most recent FCNC searches at the LHC

Wednesday, 13 April 2022 12:55 (20 minutes)

Primary author: ZHANG, Rui (University of Wisconsin Madison (US))

Presenter: ZHANG, Rui (University of Wisconsin Madison (US))

Session Classification: Top

Contribution ID: 39

Type: **not specified**

Most recent differential measurements at the LHC

Wednesday, 13 April 2022 13:20 (20 minutes)

Primary author: MAJERSKY, Oliver (Comenius University (SK))

Presenter: MAJERSKY, Oliver (Comenius University (SK))

Session Classification: Top

Contribution ID: 44

Type: **not specified**

New physics and EFT results from flavour and top physics

Wednesday, 13 April 2022 16:00 (15 minutes)

Primary authors: CORNELLA, Claudia; CORNELLA, Claudia (Universität Zürich); CORNELLA, Claudia

Presenters: CORNELLA, Claudia; CORNELLA, Claudia (Universität Zürich); CORNELLA, Claudia

Session Classification: Top/HF/EFT

Contribution ID: 45

Type: **not specified**

LHC observables vs. low-energy precision

Wednesday, 13 April 2022 16:18 (15 minutes)

Primary authors: GONZALEZ-ALONSO, Martin (IPN Lyon); GONZALEZ-ALONSO, Martin (Universidad de Valencia); GONZALEZ-ALONSO, Martin (CERN); GONZALEZ-ALONSO, Martin

Presenters: GONZALEZ-ALONSO, Martin (IPN Lyon); GONZALEZ-ALONSO, Martin (Universidad de Valencia); GONZALEZ-ALONSO, Martin (CERN); GONZALEZ-ALONSO, Martin

Session Classification: Top/HF/EFT

Contribution ID: 46

Type: **not specified**

Experimental results in CKM and Hadron Spectroscopy areas

Wednesday, 13 April 2022 16:35 (15 minutes)

Primary author: XU, Zehua (LPC Clermont CNRS/IN2P3 (FR))

Presenter: XU, Zehua (LPC Clermont CNRS/IN2P3 (FR))

Session Classification: Top/HF/EFT

Contribution ID: 47

Type: **not specified**

Latest Heavy Flavour fragmentation results

Wednesday, 13 April 2022 16:54 (15 minutes)

Primary author: MEJIA GUIAO, Jhovanny Andres (Universidad de Antioquia (CO))

Presenter: MEJIA GUIAO, Jhovanny Andres (Universidad de Antioquia (CO))

Session Classification: Top/HF/EFT

Contribution ID: **48**

Type: **not specified**

V+HF

Wednesday, 13 April 2022 18:20 (20 minutes)

Primary authors: HUSTON, Joey (Department of Physics and Astronomy); HUSTON, Joey (Michigan State University (US)); UNKNOWN, Joey Huston

Presenters: HUSTON, Joey (Department of Physics and Astronomy); HUSTON, Joey (Michigan State University (US)); UNKNOWN, Joey Huston

Session Classification: QCD/EW/HF

Contribution ID: 49

Type: **not specified**

Inclusion of V+HF data in modern PDF fits

Wednesday, 13 April 2022 17:55 (20 minutes)

Primary authors: GARZELLI, Maria Vittoria; GARZELLI, Maria Vittoria (INFN, Italia & Universidad de Granada, Espana); GARZELLI, Maria Vittoria; GARZELLI, Maria Vittoria

Presenters: GARZELLI, Maria Vittoria; GARZELLI, Maria Vittoria (INFN, Italia & Universidad de Granada, Espana); GARZELLI, Maria Vittoria; GARZELLI, Maria Vittoria

Session Classification: QCD/EW/HF

Contribution ID: 50

Type: **not specified**

Small-x resummation and differential cross sections in heavy-quark pair production

Wednesday, 13 April 2022 17:30 (20 minutes)

Primary author: SILVETTI, Federico (INFN - National Institute for Nuclear Physics)

Presenter: SILVETTI, Federico (INFN - National Institute for Nuclear Physics)

Session Classification: QCD/EW/HF

Contribution ID: 51

Type: **not specified**

Precision calculations for multiboson production and VBS

Thursday, 14 April 2022 12:30 (15 minutes)

Primary author: PELLEN, Mathieu (University of Freiburg)

Presenter: PELLEN, Mathieu (University of Freiburg)

Session Classification: Electroweak

Contribution ID: 52

Type: **not specified**

Recent results on vector boson fusion and diboson production

Thursday, 14 April 2022 12:48 (15 minutes)

Primary author: SAUVAN, Emmanuel (LAPP (IN2P3/CNRS))

Presenter: SAUVAN, Emmanuel (LAPP (IN2P3/CNRS))

Session Classification: Electroweak

Contribution ID: 53

Type: **not specified**

Recent results on Vector boson scattering and triboson production

Thursday, 14 April 2022 13:06 (15 minutes)

Primary author: COVARELLI, Roberto (University/INFN Torino (IT))

Presenter: COVARELLI, Roberto (University/INFN Torino (IT))

Session Classification: Electroweak

Contribution ID: 54

Type: **not specified**

Predictions for polarized W/Z production

Thursday, 14 April 2022 13:24 (15 minutes)

Primary authors: PELLICCIOLI, Giovanni (Würzburg University); PELLICCIOLI, Giovanni (Würzburg University)

Presenters: PELLICCIOLI, Giovanni (Würzburg University); PELLICCIOLI, Giovanni (Würzburg University)

Session Classification: Electroweak

Contribution ID: 55

Type: **not specified**

Future of Higgs

Thursday, 14 April 2022 14:15 (20 minutes)

Primary author: REINA, Laura (Florida State University (US))

Presenter: REINA, Laura (Florida State University (US))

Session Classification: Higgs

Contribution ID: 56

Type: **not specified**

Extracting kappa_lambda and c_2V from all angles

Thursday, 14 April 2022 14:40 (20 minutes)

Primary author: ENGLERT, Christoph Peter (University of Glasgow (GB))

Presenter: ENGLERT, Christoph Peter (University of Glasgow (GB))

Session Classification: Higgs

Contribution ID: 57

Type: **not specified**

HH (SM+BSM) and H BSM

Thursday, 14 April 2022 15:05 (20 minutes)

Primary author: KHOO, Teng Jian (Humboldt University of Berlin (DE))

Presenter: KHOO, Teng Jian (Humboldt University of Berlin (DE))

Session Classification: Higgs

Contribution ID: 58

Type: **not specified**

$t\bar{t}H(H \rightarrow b\bar{b})$: signal and irreducible background from the off-shell perspective

Thursday, 14 April 2022 16:00 (20 minutes)

Primary author: BEVILACQUA, Giuseppe (MTA-DE Particle Physics Research Group, Debrecen)

Presenter: BEVILACQUA, Giuseppe (MTA-DE Particle Physics Research Group, Debrecen)

Session Classification: Higgs/Top/HF

Contribution ID: 59

Type: **not specified**

Understanding the Quark Yukawa interaction; latest results and prospects

Thursday, 14 April 2022 16:25 (20 minutes)

Primary authors: MAZUMDAR, Kajari (Experimental High Energy Physics Group, Tata Institute of Fundamental Research); MAZUMDAR, Kajari (Tata Inst. of Fundamental Research (IN))

Presenters: MAZUMDAR, Kajari (Experimental High Energy Physics Group, Tata Institute of Fundamental Research); MAZUMDAR, Kajari (Tata Inst. of Fundamental Research (IN))

Session Classification: Higgs/Top/HF

Contribution ID: **60**

Type: **not specified**

New Lattice results

Thursday, 14 April 2022 16:50 (20 minutes)

Primary author: DAVIES, Christine

Presenter: DAVIES, Christine

Session Classification: Higgs/Top/HF

Contribution ID: **61**

Type: **not specified**

EW processes and EW fits

Thursday, 14 April 2022 17:30 (15 minutes)

Primary author: BRIVIO, Ilaria (University of Heidelberg)

Presenter: BRIVIO, Ilaria (University of Heidelberg)

Session Classification: Higgs/EW/EFT

Contribution ID: 62

Type: **not specified**

Measurement of Higgs CP properties and their EFT interpretations

Thursday, 14 April 2022 17:48 (15 minutes)

Primary author: LIANG, Zhijun (Chinese Academy of Sciences (CN))

Presenter: LIANG, Zhijun (Chinese Academy of Sciences (CN))

Session Classification: Higgs/EW/EFT

Contribution ID: 63

Type: **not specified**

Combined Higgs Production and decay with a focus on EFT interpretations

Thursday, 14 April 2022 18:06 (15 minutes)

Primary author: KNIGHT, Matthew (Imperial College London)

Presenter: KNIGHT, Matthew (Imperial College London)

Session Classification: Higgs/EW/EFT

Contribution ID: **64**

Type: **not specified**

global status of ew precision calculations

Thursday, 14 April 2022 18:24 (15 minutes)

Primary author: SCHOENHERR, Marek (University of Durham)

Presenter: SCHOENHERR, Marek (University of Durham)

Session Classification: Higgs/EW/EFT

Contribution ID: 66

Type: **Young Scientists Forum (YSF)**

Mixed QCD-electroweak corrections to Higgs plus jet production at the LHC

Tuesday, 12 April 2022 17:35 (8 minutes)

The detailed study of the Higgs boson is one of the main tasks of contemporary particle physics. Gluon fusion, the main production channel of Higgs bosons at the LHC, has been successfully modelled in QCD up to N³LO. To fully exploit this unprecedented theoretical effort, sub-leading contributions, such as electroweak corrections, must be investigated. I will present the analytic calculations of the gluon- and quark-induced Higgs plus jet amplitudes in mixed QCD-electroweak corrections mediated by light quarks up to order $v\alpha^2\alpha_S^{3/2}$.

Primary authors: PANZER, Erik; Prof. TANCREDI, Lorenzo (TUM); Mr BONETTI, Marco (RWTH University); SMIRNOV, Vladimir (Moscow State University)

Presenter: Mr BONETTI, Marco (RWTH University)

Session Classification: YSF

Contribution ID: **68**

Type: **not specified**

Status of the (N)NNLO calculations

Wednesday, 13 April 2022 14:15 (20 minutes)

Primary author: PONCELET, Rene (Cambridge University)

Presenter: PONCELET, Rene (Cambridge University)

Session Classification: QCD

Contribution ID: **69**

Type: **not specified**

Parton showers and matching

Wednesday, 13 April 2022 14:40 (20 minutes)

Primary author: PRESTEL, Stefan

Presenter: PRESTEL, Stefan

Session Classification: QCD

Contribution ID: 70

Type: **not specified**

Linear power corrections and small- q_T resummation

Wednesday, 13 April 2022 15:05 (20 minutes)

Primary authors: ROTTOLI, Luca; ROTTOLI, Luca (University of Zurich (CH))

Presenters: ROTTOLI, Luca; ROTTOLI, Luca (University of Zurich (CH))

Session Classification: QCD

Contribution ID: 77

Type: **Young Scientists Forum (YSF)**

Search for non-resonant Higgs bosons pairs production in the $b\bar{b}\tau\tau$ final state at CMS

Tuesday, 12 April 2022 17:45 (8 minutes)

The most recent results on non-resonant Higgs bosons pairs production in the final state with two bottom quarks and two tau leptons will be presented. This final state has a sizeable branching fraction (7.3%) and the analysis benefit also from precise tau identification algorithms developed within the CMS collaboration. The analysis targets the gluon-gluon fusion and vector boson fusion production modes. 95% CL limits are set on SM production cross section, Higgs boson trilinear self-coupling and coupling of two Higgs bosons to two vector bosons. The sensitivity achieved by this search, performed with the full Run2 data set, is five times better than the one published using the LHC 2016 data set only. The improvement is determined by the larger statistics, the improved trigger strategy and by the use of Deep Neural Networks to perform objects selection and signal discrimination.

Primary author: LEON HOLGADO, Jaime (Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

Presenter: LEON HOLGADO, Jaime (Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

Session Classification: YSF

Contribution ID: 80

Type: **Young Scientists Forum (YSF)**

Observation of VBS production in opposite-sign WW events at CMS

Tuesday, 12 April 2022 17:55 (8 minutes)

The observation of the electroweak production of a $W+W-$ pair in association with two jets, with both W bosons decaying leptonically, is reported. The data sample corresponds to an integrated luminosity of 138fb^{-1} of proton-proton collisions at $\sqrt{s} = 13\text{ TeV}$, collected by the CMS detector at the CERN LHC. A signal is observed (expected) with a significance of 5.6 (5.2) standard deviations with respect to the background-only hypothesis.

Primary author: PINOLINI, Bianca Sofia**Presenter:** PINOLINI, Bianca Sofia**Session Classification:** YSF

Contribution ID: 81

Type: **Young Scientists Forum (YSF)**

Flavour Tagging with Jet Substructure

Tuesday, 12 April 2022 18:05 (8 minutes)

Jets are collimated bunches of hadrons ubiquitous in the detectors at the LHC. Studying the internal structure of these objects is essential to identify the original objects that originate the jet and to understand the underlying physical process. An important category of Jet Substructure (JSS) observables are *Jet Angularities* which have been recently calculated in resummed perturbation theory [1, 2] and measured in the Z+Jet and dijet processes at the LHC.

In this talk I will discuss how Jet Angularities can be exploited to define an infrared and collinear safe jet flavour tagger considering a recently proposed [3] application in the context of the Z+Jet process. In particular, by tagging the final state jet as quark-initiated we have been able to enhance the initial-state gluon contribution. I discuss new resummed theoretical predictions for the transverse momentum distributions of events selected by the tagger which would be potentially interesting to probe the gluonic degrees of freedom of the colliding protons.

Primary author: CALETTI, Simone**Presenter:** CALETTI, Simone**Session Classification:** YSF

Contribution ID: 85

Type: Young Scientists Forum (YSF)

Differential cross-sections for $t\bar{t}j + X$ production at the LHC

Tuesday, 12 April 2022 18:15 (8 minutes)

The fundamental SM parameter of the top quark mass can be measured with unprecedented accuracy at LHC due to the large production cross section for top quark pairs, and top quark pairs in association with at least one hard jet. The extraction of this quantity can be achieved using the ρ_s distribution, an observable related to the invariant mass of the t-tbar + jet system. Thereby, the top-quark mass extraction can be performed using different mass renormalisation schemes. We present theory predictions useful for this extraction in the on-shell, the MSbar and, for the first time, the MSR scheme.

In view of the high experimental accuracy, which is reached in measuring the relevant production cross sections at the LHC, the control over the associated theory uncertainties becomes increasingly important. To this end we present a study of the effect of varying theoretical input parameters in the calculation of t-tbar + jet + X NLO differential cross sections. We investigate the effect of static and dynamical renormalization and factorization scale definitions and different PDF sets as well as the influence of the R parameter in the jet reconstruction procedure. We make public a set of reference fiducial cross-sections for different cuts, that we expect to be very useful for the forthcoming LHC experimental analyses at $\sqrt{s} = 13$ TeV and higher center-of-mass energies.

Primary authors: IRLES, Adrian (IFIC CSIC/UV); VOSS, Katharina (University of Siegen (DE)); GAVARDI, Alessandro; MELINI, Davide (Technion- Israel Institute of Technology (IL)); FUSTER VERDÚ, Juan (IFIC-Valencia (ES)); GARZELLI, Maria Vittoria; UWER, Peter (Humboldt-Universität zu Berlin); MOCH, S.; ALIOLI, Simone (Universita & INFN, Milano-Bicocca (IT))

Presenter: VOSS, Katharina (University of Siegen (DE))

Session Classification: YSF

Contribution ID: 87

Type: **Young Scientists Forum (YSF)**

The Drell-Yan q_T Spectrum and Its Uncertainty at N^3LL'

Tuesday, 12 April 2022 18:25 (8 minutes)

We present state-of-the-art SCETlib predictions for the W and Z/γ^* transverse-momentum (q_T) distributions at the LHC at complete three-loop order in resummed perturbation theory (N^3LL') and matched to available fixed order. We pay particular attention to the estimation of theory uncertainties via profile scale variations in such a way that perturbative uncertainties due to PDF evolution, perturbative resummation uncertainties, and nonperturbative uncertainties for $q_T \rightarrow 0$ are cleanly disentangled, and compare our predictions to high-precision measurements by the ATLAS and CMS experiments. The speed and versatility of our resummed calculation also allow us to study the dependence on the strong coupling, the PDFs, and their parametric uncertainties at this order. We find intriguing evidence that the normalized ATLAS and CMS Z q_T spectra may prefer a lower strong coupling than the PDG value.

Primary author: MICHEL, Johannes (MIT CTP)**Presenter:** MICHEL, Johannes (MIT CTP)**Session Classification:** YSF

Contribution ID: 89

Type: **Young Scientists Forum (YSF)**

A search for the dimuon decay of the Standard Model Higgs boson in pp collisions at 13 TeV with the ATLAS Detector

Tuesday, 12 April 2022 18:35 (8 minutes)

A search for the dimuon decay of the Standard Model (SM) Higgs boson is performed using data corresponding to an integrated luminosity of 139/fb collected with the ATLAS detector in Run2 pp collisions at 13 TeV at the Large Hadron Collider. The observed (expected) significance over the background-only hypothesis for a Higgs boson with a mass of 125.09 GeV is 2.0σ (1.7σ). The observed upper limit on the cross section times branching ratio is 2.2 times the SM prediction at 95% confidence level, while the expected limit on a $H \rightarrow \mu\mu$ signal assuming the absence (presence) of a SM signal is 1.1 (2.0). The best-fit value of the signal strength parameter, defined as the ratio of the observed signal yield to the one expected in the SM, is $\mu=1.2 \pm 0.6$.

Primary authors: CHEN, Ye (University of Science and Technology of China (CN)); CHEN, Ye (Hefei University of Science and Technology of China)

Presenters: CHEN, Ye (University of Science and Technology of China (CN)); CHEN, Ye (Hefei University of Science and Technology of China)

Session Classification: YSF

Contribution ID: **90**

Type: **not specified**

Announcement

Thursday, 14 April 2022 12:20 (10 minutes)

Primary authors: HUSS, Alexander Yohei (CERN); CARLI, Tancredi (CERN)

Presenters: HUSS, Alexander Yohei (CERN); CARLI, Tancredi (CERN)

Contribution ID: **91**

Type: **not specified**

High-precision measurement of the W boson mass with the CDF II detector

Wednesday, 13 April 2022 18:45 (20 minutes)

Primary author: HAYS, Chris (University of Oxford (GB))

Presenter: HAYS, Chris (University of Oxford (GB))