

T 100: Elektroschwache Wechselwirkung (Experiment) III

Zeit: Donnerstag 16:45–18:45

Raum: VMP8 SR 206

T 100.1 Do 16:45 VMP8 SR 206

Combined QCD and electroweak analysis of HERA data — ●VOLODYMYR MYRONENKO — DESY, Hamburg, Germany

A simultaneous fit of PDFs and electroweak parameters to HERA deep inelastic scattering data is presented. The input data are the neutral current, NC, and charged current, CC, inclusive cross sections that were previously used in the QCD analysis providing the HERAPDF2.0 PDFs. The NLO QCD plus LO electroweak analysis uses information on polarisation of the electron beam for the ZEUS data taken between 2004 and 2007. Results on the vector and axial-vector couplings of the Z boson to u- and d-type quarks, on the value of the electroweak mixing angle and the mass of the W boson are presented. The values obtained for the electroweak parameters are in agreement with Standard Model predictions.

T 100.2 Do 17:00 VMP8 SR 206

Differential cross section measurements in events with two photons and N jets at $\sqrt{s} = 8$ TeV with the ATLAS detector — ●MARTIN BESSNER and KERSTIN TACKMANN — DESY

Isolated prompt photons allow to probe the physics of proton-proton collisions as they are sensitive to the gluon parton distribution functions.

Preliminary measurements of cross sections of pairs of isolated prompt photons with and without additional jets are presented. Collision data from the ATLAS detector at the LHC is used, corresponding to an integrated luminosity of 20.3 fb^{-1} collected in 2012 at a center-of-mass energy of 8 TeV. The cross sections have been measured differentially as function of different observables and the number of jets at the same time. Background subtraction and sources of systematic uncertainties are discussed. A focus is put on the unfolding procedure, where SVD unfolding has been generalized to work with two-dimensional distributions. The measurements of cross sections are compared to theory predictions.

T 100.3 Do 17:15 VMP8 SR 206

Differentielle Messung des Dijet Wirkungsquerschnitts und PDF Studien — ●GEORG SIEBER, KLAUS RABBERTZ und GÜNTER QUAST — EKP, KIT

Bei QCD-Präzisionsstudien an Proton-Beschleunigern stellt die innere Struktur des Protons eine der dominierenden Unsicherheitsquellen dar. Das Proton lässt sich über Partonverteilungsfunktionen (PDFs) beschreiben. Die PDFs können nicht störungstheoretisch berechnet werden, sondern müssen aus experimentellen Messungen abgeleitet werden.

Die Produktion von hadronischen Jets ist einer der dominierenden Prozesse am Large Hadron Collider (LHC). Mit dem CMS-Detektor wurde der differentielle Wirkungsquerschnitt der Dijet-Produktion bei einer Schwerpunktsenergie von 8 TeV gemessen.

Mit Hilfe dieser Messung können die Proton PDFs, insbesondere die PDF des Gluons, bei hohen Partonimpulsanteilen x verbessert werden.

T 100.4 Do 17:30 VMP8 SR 206

PDF constraints from CMS measurement of W charge asymmetry and inclusive jet cross sections at 8 TeV — ●ENGIN EREN and KATERINA LIPKA — Notkestraße 85, 22607 Hamburg

In this talk, the impact of the CMS measurements on the knowledge of the proton structure is discussed. The measurements of the W-boson charge asymmetry and of inclusive jet cross sections at a center-of-mass energy of 8 TeV are used in a QCD analysis to determine the parton distribution functions. For this purpose, the open-source framework HERAFitter is used. A significant reduction of the uncertainties on the gluon and valence-quark distributions is observed.

T 100.5 Do 17:45 VMP8 SR 206

Bestimmung der PDFs des Protons durch Präzisionsmessungen des Z+Jet-Wirkungsquerschnitts — ●DOMINIK HAITZ, KLAUS RABBERTZ und GÜNTER QUAST — Institut für Experimentelle Kernphysik, Karlsruher Institut für Technologie

Die Messung des Wirkungsquerschnitts der Z-Boson-Produktion am LHC bietet einen hervorragenden Test für die Vorhersagen des Standardmodells. Durch die präzise Messung von Z-Bosonen können zusätzlich die Parameter der Partonverteilungsfunktionen (PDFs) des Protons weiter eingeschränkt werden.

Das Z-Boson wird im Elektron-Zerfallskanal rekonstruiert. Dies erfordert ein genaues Verständnis von Rekonstruktionseffizienz und Energieskala der Elektronen. Verschiedene Untergrundprozesse werden betrachtet und ihre Beiträge zur finalen Ereignisauswahl abgeschätzt. Die gemessenen kinematischen Verteilungen werden entfaltet; systematische und statistische Unsicherheiten werden bestimmt.

Mithilfe von Monte-Carlo-Simulationen und Interpolationsprogrammen werden Vorhersagen des Wirkungsquerschnitts der Z+Jet-Produktion für verschiedene PDFs berechnet.

Aus dem Vergleich der Daten mit den Theorievorhersagen werden die Parameter der Proton-PDFs genauer bestimmt.

T 100.6 Do 18:00 VMP8 SR 206

Measurement of the Z boson cross section at $\sqrt{s} = 13$ TeV — ●ARTUR TROFYMOV — DESY, Hamburg, Germany

Measurements of the $Z \rightarrow l^+l^-$ (where $l = e, \mu$) production cross sections in proton-proton collisions at $\sqrt{s} = 13$ TeV are presented using data recorded by the ATLAS experiment at the LHC, corresponding to a total integrated luminosity of approximately 85 pb^{-1} . The total inclusive Z boson production cross section within the invariant mass window $66 < m_{ll} < 116$ GeV was measured. The Z boson production cross section and its ratios to W^\pm and $t\bar{t}$ production cross sections are measured within a fiducial region defined by the detector acceptance. Theoretical predictions based on NNLO and NLO QCD calculations using different PDF sets and predictions from different Monte Carlo generators are compared to the measurements.

T 100.7 Do 18:15 VMP8 SR 206

Measurement of Z boson production cross section in the dilepton channels and the ratio of $t\bar{t}$ to Z boson production cross sections in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector — ●NATALIJA ZAKHARCHUK — Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany

A measurement of Z boson production cross sections σ_Z in pp collisions at a centre-of-mass energy $\sqrt{s} = 13$ TeV is presented. Results are obtained in both $Z \rightarrow \mu\mu$ and $Z \rightarrow ee$ channels, based on data corresponding to an integrated luminosity of $3,3 \text{ fb}^{-1}$ collected with the ATLAS detector at the LHC during the year 2015. The selection criteria of the measurement are optimized to be as close as possible to the measurement of the $t\bar{t}$ production cross section $\sigma_{t\bar{t}}$, using the same data. This leads to a 13 TeV cancellation of the systematic uncertainties for the cross section ratio $R_{t\bar{t}/Z}^{13\text{TeV}} = \sigma_{t\bar{t}}/\sigma_Z$. The experimental results are compared to the predictions of perturbative QCD calculations at next-to-next-to-leading orders using various sets of parton distribution functions.

T 100.8 Do 18:30 VMP8 SR 206

Measurements of Z boson plus jet production cross section with the ATLAS detector using $\sqrt{s} = 8$ TeV data — ●NATALIJA KONDRASHOVA — DESY, Hamburg, Germany

The $Z \rightarrow ee + \text{jet}$ production provides an important test of perturbative Quantum Chromodynamics and is an important background for many Standard Model processes and beyond Standard Model searches. In addition, the measurement of the $Z \rightarrow ee + \text{jet}$ cross-section as a function of the absolute rapidity and the transverse momentum of jets can provide constraints on the uncertainties in the parton distribution functions. Preliminary results of the double-differential $Z \rightarrow ee + \text{jet}$ production cross-section measurement are presented. The data of 21.3 fb^{-1} collected with the ATLAS detector at the Large Hadron Collider in 2012 at the centre-of-mass energy $\sqrt{s} = 8$ TeV are used. Main sources of the systematic uncertainties in the measurement are studied. The measured cross-section is compared to the predictions from Monte Carlo generators based on the leading order matrix elements supplemented by the parton showers.