

Zeit: Dienstag 16:45–18:55

Raum: ZHG 009

Gruppenbericht T 26.1 Di 16:45 ZHG 009
Measurement of D^{+-} production in DIS with the ZEUS Detector at HERA — ACHIM GEISER, MYKHAILO LISOVYI, and
 ●OLEKSANDR ZENAIEV — DESY

The dominant contribution to charm production in deep inelastic scattering (DIS) at the HERA ep collider is boson-gluon fusion. Therefore the charm cross section is directly sensitive to the gluon density function in the proton as well as to the charm quark mass. A charm quark was identified by the reconstruction of the D^{+-} meson decay $D^{+-} \rightarrow K^{-+}\pi^{+-}\pi^{+-}$. Such weak decays allow to use the Micro-Vertex Detector (MVD) for lifetime tagging, to reduce combinatorial background and to increase the purity of the data sample. Inclusive and differential cross sections for D^{+-} production were measured and compared with previous results. The extraction of the charm contribution to the proton structure function F_2 , F_2^c , and its inclusion into a general QCD fit allows to constrain the parton densities in the proton.

Gruppenbericht T 26.2 Di 17:05 ZHG 009
Measurements of D^* production in DIS with the ZEUS detector — ●OLENA BACHYNSKA — DESY (Deutsches Elektronen-Synchrotron)/ Hamburg Universität, Hamburg, Notkestrasse 85

Charm production at the HERA collider was studied using the ZEUS detector. Measurements were performed in the deep inelastic scattering regime, where the incoming lepton scatters on the proton with a large angle and can be seen in the detector. Charm production in DIS is dominated by the boson-gluon fusion process. It was studied via $D^{*+} \rightarrow K^+, \pi^-, \pi_s^+$ meson decay and its charge conjugate. The DIS events were reconstructed in the region of $5 < Q^2 < 1000 \text{ GeV}^2$, $0.02 < y < 0.7$, where Q^2 is the virtuality of the exchanged photon and y is the inelasticity. D^* mesons were required to have $|\eta(D^*)| < 1.5$ and $1.5 < p_T(D^*) < 20 \text{ GeV}/c$. Single differential and double-differential cross sections were measured and compared to NLO predictions and to the results from the H1 collaboration. The charm contribution to the proton structure function, $F_2^{c\bar{c}}$, was extracted and compared to the ZEUS D^+ measurements and to the HERA combined results.

T 26.3 Di 17:25 ZHG 009
Inclusive-jet photoproduction at HERA — ●DENYS LONTKOVSKYI — Notkestrasse 85, DESY, Hamburg, Germany

The study of jet production at ep collider HERA has been well established as a way of testing perturbative QCD. Jet cross sections allow to test theory predictions, extract the fundamental parameter of the theory, α_s , and give a valuable input for QCD fits in order to determine the parton distribution functions of the proton. Inclusive-jet cross sections were measured in $ep \rightarrow e + \text{jet} + X$ for photon virtuality $Q^2 < 1 \text{ GeV}^2$ and γp centre-of-mass energies in range $142 < W_{\gamma p} < 293 \text{ GeV}$ with the ZEUS detector using an integrated luminosity of 300 pb^{-1} . Single-differential cross sections are presented as functions of the jet transverse energy, E_T^{jet} , and pseudorapidity, η^{jet} , for jets with $E_T^{\text{jet}} > 17 \text{ GeV}$ and $-1 < \eta^{\text{jet}} < 2.5$. In addition, measurements of double-differential inclusive-jet cross sections are presented as functions of E_T^{jet} in different regions of η^{jet} . Next-to-leading-order QCD predictions are compared to the measurements, and give a good description of the measured cross sections except at high η^{jet} . Precise values of $\alpha_s(M_Z)$ were extracted from the measurements and the energy-scale dependence of the coupling was determined.

T 26.4 Di 17:40 ZHG 009
Dijet cross sections in photoproduction at HERA — ●INNA MAKARENKO — Notkestrasse 85, DESY, Hamburg, Germany

At high collision energies accessible at ep collider HERA hard hadronic jets can be produced. At leading order, at low virtualities of the exchanged photon, two processes contribute to the jet production. In the direct photon process an almost real photon interacts as a point-like particle with a parton of the proton. In contrast in resolved processes the photon fluctuates to an hadronic state. The measurements of the jet production give an important information about the structure of the photon and the proton. Dijet cross sections have been measured in the reaction $ep \rightarrow e + \text{jet} + \text{jet} + X$ with the ZEUS detector using an integrated luminosity of 189 pb^{-1} . Differential cross sections are presented as functions of average jet transverse energy and pseudorapidity for dijet events with $E_T^{\text{jet1}} > 21 \text{ GeV}$, $E_T^{\text{jet2}} > 17 \text{ GeV}$, $-1 < \eta^{\text{jet1(2)}} < 3$ for

γp centre-of-mass energies in range $142 < W_{\gamma p} < 293 \text{ GeV}$ and photon virtuality $Q^2 < 1 \text{ GeV}^2$. In addition, the dijet cross section was measured as a function of the fraction of the incoming photon momentum taken by the dijet system. The dijet cross sections were also measured as functions of the dijet invariant mass, M_{jj} and scattering angle in the dijet centre-of-mass system for $E_T^{\text{jet1(2)}} > 17 \text{ GeV}$, $-1 < \eta^{\text{jet1(2)}} < 3$ and $M_{jj} > 60 \text{ GeV}$. Next-to-leading order calculations give a good description of the measurements. These measurements can be used to further constraint the gluon component of the proton parton density function at medium to high x .

T 26.5 Di 17:55 ZHG 009
Regularisierte Entfaltung von Detektoreffekten bei der Messung inklusiver Jet-, Dijet und Trijet Wirkungsquerschnitte — ●DANIEL BRITZGER¹, GÜNTER GRINDHAMMER² und ROMAN KOGLER¹ — ¹Deutsches Elektronen-Synchrotron DESY, Hamburg — ²Max-Planck-Institut für Physik, München

Es wird eine Methode der gleichzeitigen Entfaltung von Messungen der Wirkungsquerschnitte der inklusiven Jet-, der Dijet und Trijet Produktion, sowie der inklusiven tief-inelastischen Streuung bei hohem Q^2 am H1 Experiment vorgestellt. Aufgrund von imperfekten Modellvorhersagen und unvermeidbaren Detektoreffekten, wie endliche Akzeptanz und Ungenauigkeiten der Jetenergiemessung, muss die Messung von Jetwirkungsquerschnitten für diese Effekte korrigiert werden. Hierfür wird eine regularisierte Entfaltung angewendet, bei der die generierten Observablen mit entsprechenden rekonstruierten Observablen nach der Detektorsimulation verknüpft werden. Durch die simultane Entfaltung können die Korrelationen aufgrund kinematischer Migrationen zwischen den Bins der einzelnen Messungen als auch die Korrelationen zwischen den verschiedenen Messungen bestimmt werden.

Es werden die Ergebnisse der inklusiven Jet-, der Dijet- und Trijetmessung vorgestellt und mit Vorhersagen der perturbativen QCD verglichen. Die erhaltenen Wirkungsquerschnitte werden unter Zuhilfenahme der vollständigen Korrelationen dazu verwendet die starke Wechselwirkungskonstante $\alpha_s(M_Z)$ zu bestimmen.

T 26.6 Di 18:10 ZHG 009
Analyse erster Daten des ALFA Detektors bei ATLAS — ●KRISTOF KREUTZFELDT, MICHAEL DÜREN, YONG LIU und HASKO STENZEL — Justus-Liebig-Universität Gießen

Der ALFA (Absolute Luminosity For ATLAS) Detektor befindet sich im Vorwärtsbereich des ATLAS-Experiments im LHC Tunnel ca. 240 m vom Wechselwirkungspunkt entfernt. Mit dem Detektor aus szintillierenden Fasern kann elastische pp-Streuung unter kleinsten Streuwinkeln gemessen werden. Der Detektor ist in Roman Pots untergebracht und kann unter speziellen Strahlbedingungen sehr nahe an den Strahl gefahren werden. Eine ersten Datennahme fand im Herbst 2011 bei einer Schwerpunktsenergie von $\sqrt{s} = 7 \text{ TeV}$ und Strahloptik mit $\beta^* = 90 \text{ m}$ statt, mit dem Ziel der Messung des elastischen und totalen Wirkungsquerschnittes und des nuklearen Steigungsparameters. In diesem Vortrag werden die Ergebnisse der vorläufigen Analyse der Daten präsentiert.

T 26.7 Di 18:25 ZHG 009
The Castor calorimeter at the CMS experiment — ●PAOLO GUNNELLINI — Desy, Notkestraße 85 D-22607 Hamburg

The CASTOR Calorimeter at the CMS experiment is an electromagnetic/hadronic calorimeter which covers the very forward region of the detector ($-6.6 < \eta < -5.2$). CASTOR is a Cherenkov sampling calorimeter, consisting of quartz and tungsten plates, with an overall depth of 10 interaction lengths, able to detect penetrating cascade particles. It is segmented in 16 transversal and 14 longitudinal sections. Surrounding the beam pipe, its design is determined by space constraints and restricted to materials which tolerate a high radiation level. Initial performance studies of the calorimeter were performed with test beam measurements. In this presentation we report on the first operational experience and measurements with the CASTOR calorimeter during the 2010 data taking at the LHC, with proton-proton and heavy ion collisions. An overview of the broad physics program which can be accessed with CASTOR, as well as the status of ongoing physics analyses and detector studies are presented.

T 26.8 Di 18:40 ZHG 009

Energy-calibration of the forward calorimeter CASTOR with particle decays in the CMS experiment — •HAUKE WÖHRMANN
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The CMS(Compact Muon Solenoid) experiment is a detector system to analyse hadronic collisions at the LHC(Large Hadron Collider). For studying high energy physics CMS covers a large rapidity range at LHC. One subdetector of CMS to measure in this high rapid-

ity region around 6 is the CASTOR(Centauro And STrange Object Research) calorimeter. CASTOR has an electromagnetic($20 X_0$) and hadronic($10 \lambda_I$) section where each is build of alternative layers of tungsten- and quartz-plates. The charged particles produce cherenkov-photons in this quartz-plates. Because of a residual magnetic field at the detector location an energy calibration is difficult. For this purpose we investigate the approach to use the electromagnetic two-body-decay of well known particles like Z or pi0. Therefore we run over $50 pb^{-1}$ of data and determine clean electromagnetic signals in the detector.