

T 34: Starke Wechselwirkung (Experiment) II

Zeit: Montag 16:45–18:30

Raum: VMP8 SR 206

T 34.1 Mo 16:45 VMP8 SR 206

Measurement of the transverse momentum and ϕ_η^* distributions of Drell-Yan lepton pairs in proton-proton collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector — ●SAMUEL WEBB, MATTHIAS SCOTT, and TAI-HUA LIN — Johannes-Gutenberg-Universität Mainz

Measurements of Z-boson transverse momentum ($p_T^{\ell\ell}$), spectra in Drell-Yan events are important tests of QCD – at high $p_T^{\ell\ell}$ the spectra may be described by fixed-order perturbative QCD predictions and at lower $p_T^{\ell\ell}$ using soft-gluon resummation together with a non-perturbative contribution from the parton intrinsic transverse momentum. The correct modelling of $p_T^{\ell\ell}$ is also important for physics analyses at the LHC for which the production of W and/or Z bosons constitutes a background and is a crucial ingredient for a precise measurement of the W-boson mass. A complementary observable ϕ_η^* , defined in terms of the well-measured decay-lepton directions, can be used to probe the low $p_T^{\ell\ell}$ domain with higher precision. Measurements of $p_T^{\ell\ell}$ and ϕ_η^* using ATLAS data at a centre of mass energy of $\sqrt{s} = 8$ TeV are presented. These measurements are performed in bins of lepton-pair mass above, around and below the Z-boson mass peak and are compared to a variety of theoretical predictions including from ResBos and DYNLO.

T 34.2 Mo 17:00 VMP8 SR 206

Production of b-jets and pairs of b-jets with associated jets at CMS at 13 TeV — ●PATRICK CONNOR, PAOLO GUNNELINI, and HANNES JUNG — Deutsches Elektronen-Synchrotron, Hamburg

In the Standard Model, the b-quark is the heaviest quark that can hadronise, and is therefore an excellent probe for higher-order QCD contributions. The CMS detector provides a sufficient resolution to measure the production of b-jets and pairs of b-jets with associated jets. In particular, we investigate transverse-momentum effects in the parton density functions (TMDs).

In the talk, we present Monte Carlo studies and preliminary results from 13 TeV data.

T 34.3 Mo 17:15 VMP8 SR 206

Messung des J/ψ Meson und des $b\bar{b}$ Wirkungsquerschnitt bei 13 TeV in Run-II des LHCb Experiments — ●SVENDE BRAUN, SEVDA ESEN und STEPHANIE HANSMANN-MENZEMER — Physikalisches Institut Universität Heidelberg

In Run-II des LHC ist es erstmals möglich Proton-Proton Kollisionen mit einer Schwerpunktsenergie von 13 TeV zu studieren. Eine Studie zur Produktion von Quarkonium, B- und D-Mesonen bei dieser Energie ist wichtig fuer das Verständnis der QCD. In diesem Vortrag wird die Messung des J/ψ Meson Produktions-Wirkungsquerschnittes bei 13 TeV vorgestellt und mit verschiedenen Theorievorhersagen verglichen. Es wird hierfuer ein Datensatz von $3 pb^{-1}$ untersucht, der im Juli 2015 aufgezeichnet wurde. Es werden direkt in der pp-Kollision produzierte J/ψ Mesonen und J/ψ aus B-Mesonen Zerfaellen unterschieden. Letztere werden benutzt um den totalen $b\bar{b}$ Wirkungsquerschnitt zu bestimmen.

T 34.4 Mo 17:30 VMP8 SR 206

Precision studies of three pion final states of J/Ψ and Ψ' at BESIII — ●STUART FEGAN — Johannes Gutenberg Universität, Mainz

The BESIII experiment at the Institute of High Energy Physics, Chinese Academy of Sciences, in Beijing, has been operating since 2008 with the aim of accumulating large data samples from e^+e^- collisions for detailed studies in the fields of charm physics and hadron spectroscopy. These data include large samples of J/Ψ and Ψ' decays collected during run periods in 2009 and 2012.

The three pion final states ($\pi^+\pi^-\pi^0$) of J/Ψ and Ψ' production were previously studied using the 2009 BESIII data, confirming the unexpectedly low branching fraction of the Ψ' and revealing markedly

different di-pion mass spectra and Dalitz ditributions in comparison to the J/Ψ . These differences have yet to be fully explained, and form the basis of the so-called ‘ $\rho\pi$ puzzle’.

The work presented will focus on efforts to realise more precise studies of these states in BESIII by including the larger 2012 data set in the analysis, and the application of robust partial wave analysis (PWA) techniques being developed in Mainz.

T 34.5 Mo 17:45 VMP8 SR 206

Measurement of the very-forward energy spectrum in pp collisions at $\sqrt{s} = 13$ TeV with CMS — ●SEBASTIAN BAUR, MELIKE AKBIYIK, COLIN BAUS, IGOR KATKOV, RALF ULRICH, and HAUKE WÖHRMANN — Karlsruher Institut für Technologie

The energy spectrum dN/dE in pp collisions at a centre-of-mass energy of $\sqrt{s} = 13$ TeV is measured with the CASTOR calorimeter of CMS at pseudorapidities $-5.2 > \eta > -6.6$. The spectrum of the total energy, as well as the hadronic and electromagnetic energy, is presented and compared to models used to describe high-energy hadronic interactions. The performance also of model used to describe ultra-high energy cosmic ray air showers is tested and the possible impact of the measurement on the air shower development is illustrated.

T 34.6 Mo 18:00 VMP8 SR 206

Hadron Production in Photon-Photon Processes at the ILC — ●KOLLASSERY SWATHI SASIKUMAR^{1,2}, CARL MIKAEL BERGGREN¹, and JENNY LIST¹ — ¹Deutsches Elektronen-Synchrotron DESY, Notkestraße 85, 22607 Hamburg — ²Universität Hamburg, Institut für Experimentalphysik, Luruper Chaussee 149, 22761 Hamburg

The International linear Collider (ILC) is a proposed e^+e^- collider, designed to operate at energies from 91 GeV upto about 500 GeV (with the possibility to upgrade to 1 TeV). The highly clean conditions provided by the ILC enables us to make high precision measurements e.g. of the Higgs boson and to search for new particles.

In addition to the desired e^+e^- collisions, parasitic collisions of real and virtual photons radiated off the e^\pm beams occur at rates of a few $\gamma\gamma$ collisions per bunch crossing. The $\gamma\gamma$ centre of mass energies reach from few 100 MeV up to the full e^+e^- centre of mass energy. For all these energies, in particular the production of hadrons, needs to be modelled correctly in order to estimate the impact of these backgrounds which pile-up on each e^+e^- event. This contribution discusses the current simulations of $\gamma\gamma \rightarrow$ hadron processes, evaluates their impact on the detector and introduces new methods to remove them from the interesting physics events.

T 34.7 Mo 18:15 VMP8 SR 206

Measurement of resonance production in pion-carbon interactions at 158 and 350 GeV/c with NA61/SHINE — ●ALEXANDER HERVE for the NA61/SHINE-Collaboration — KIT, Karlsruhe, Germany

The interpretation of extensive air shower measurements, produced by ultra-high energy cosmic rays, relies on the correct modelling of the hadron-air interactions that occur during the shower development. The majority of hadronic particles is produced at equivalent beam energies below the TeV range.

NA61/SHINE is a fixed target experiment at the CERN Super Proton Synchrotron, studying hadron production in hadron-nucleus and nucleus-nucleus collisions to provide valuable contributions to a number of subjects, from neutrino through cosmic-ray to heavy-ion physics.

Pion-Carbon interactions have been performed, at 158 and 350 GeV/c, to give precise particle production measurements for the most numerous projectile in air showers, the π meson. The ability to measure the production of resonances, such as the ρ^0 and ω mesons, is particularly important to predict the number of muons produced in air showers.

In this contribution we present updated results of resonance spectra at 158 and 350 GeV/c measured by NA61/SHINE.