

HK 40: Hadron Structure and Spectroscopy 9

Time: Wednesday 14:30–16:15

Location: T/SR19

Group Report

HK 40.1 Wed 14:30 T/SR19

Linearly polarised photons at the BGO-OD experiment* —

•ANDREAS BELLA for the BGO-OD-Collaboration — Physikalisches Institut, Universität Bonn

The BGO-OD experiment, located at the ELSA accelerator of the University of Bonn, aims at the study of photoproduction reactions off the nucleon. A real, energy-tagged photon beam is produced via bremsstrahlung by irradiating a thin radiator with the electron beam provided by ELSA.

Linear polarisation is obtained by coherent bremsstrahlung. This requires a crystal radiator; in our case a 570 μm thick diamond is used.

The production mechanism of a linearly polarised photon beam via coherent bremsstrahlung, the determination of the degree of polarisation and first results obtained with a linearly polarised photon beam will be shown in this talk.

*Supported by DFG (SFB/TR-16)

HK 40.2 Wed 15:00 T/SR19

Improved LO extraction of the gluon polarisation using COMPASS data —

•MALTE WILFERT — for the COMPASS collaboration — Institut für Kernphysik, Johannes Gutenberg-Universität Mainz, Johann-Joachim-Becher-Weg 45, 55099 Mainz

The COMPASS experiment at the M2 beamline of the CERN SPS has taken data with a polarised muon beam ($E = 160$ GeV) scattering off a polarised LiD target from 2002 to 2006. The events in the DIS region are re-analysed to extract simultaneously the gluon polarisation $\Delta g/g$ and the leading process asymmetry from the same data using a Neural Network approach. The new method of extracting $\Delta g/g$ will be presented. The main feature of this method is a reduction of both the systematic and the statistical uncertainty of the gluon polarisation obtained in LO. The new result is in good agreement with the already published one in PLB 718 (2013) 922 and will be presented in three bins of gluon momentum fraction x_g .

Supported by BMBF under the contract 05P12UMCC1 and GRK Symmetry Breaking (DFG/GRK 1581)

HK 40.3 Wed 15:15 T/SR19

Presentation of K_s^0 Multiplicities from 2006 at COMPASS*

— •DANIEL HAHNE — Physikalisches Institut Bonn

To describe the hadronization process of quarks into hadrons in deep inelastic scattering, knowledge of fragmentation functions is necessary. To extract fragmentation functions from data taken by the COMPASS experiment, final state hadrons are analyzed in addition to the incoming and scattered muon. I will give a status report of K_s^0 multiplicities from data taken in 2006 by the COMPASS experiment which can be used to parameterize K_s^0 fragmentation functions.

*supported by BMBF, project 05P12 PDCCA

HK 40.4 Wed 15:30 T/SR19

Determination of the Spin Triplet $p\Lambda$ Scattering Length from the Reaction $\bar{p}p \rightarrow pK^+\Lambda$ —

•FLORIAN HAUENSTEIN for the COSY-TOF-Collaboration — Forschungszentrum Jülich, Deutschland

The $\bar{p}p \rightarrow pK^+\Lambda$ reaction was measured with the COSY-TOF de-

tektor using a polarized proton beam of 2.7 GeV/c. These data are used to not only study the production mechanism via Dalitz plot and polarization observables, but also to extract the spin effective $p\Lambda$ scattering length from the final state interaction in the $p\Lambda$ invariant mass spectrum. Furthermore, it is possible to determine the spin triplet $p\Lambda$ scattering length using the dependence of the Kaon analyzing power on the $p\Lambda$ invariant mass.

In this talk the extraction method as well as the results on the spin effective and spin triplet $p\Lambda$ scattering length will be shown. In addition, the dependence of the Kaon analyzing power on the $p\Lambda$ invariant mass will be given. The systematic errors of the extracted values will be discussed

HK 40.5 Wed 15:45 T/SR19

Measurement of the double polarization observable G and beam asymmetry Σ in pion photoproduction —

•KARSTEN SPIEKER for the A2-Collaboration — Helmholtz-Institut für Strahlen- und Kernphysik, Universität Bonn

The excitation spectrum of baryons consists of many resonances which contribute selectively to distinct decay channels. To obtain information about the contributing resonances, Partial Wave Analyses (PWA) are performed to identify the resonances and characterize their properties. For an unambiguous partial wave analysis solution, the measurement of several well chosen single and double polarization observables is needed in different decay channels.

The polarization observables are measured at the A2 experiment at MAMI in Mainz, using polarized photons and polarized nucleons. The setup covers nearly 4π of the solid angle and has a high detection efficiency for neutral and charged final states. It is therefore perfectly suited for the detection of pions in the final state.

The preliminary results for the double polarization observable G and the beam asymmetry Σ in pion photoproduction are presented. They have been determined in an energy range $E_\gamma = 200\text{--}800$ MeV, using a linearly polarized photon beam in combination with a longitudinally polarized butanol target. Therefore, it is the first measurement of the double polarization observable G below 500 MeV.

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HK 40.6 Wed 16:00 T/SR19

Study of chiral dynamics in $\pi^-\pi^0\pi^0$ production in Primakoff reactions at COMPASS —

•MARKUS KRÄMER — Technische Universität München, Germany

COMPASS is a fixed-target experiment at CERN, which uses muon and hadron beams produced at the SPS to address a wide variety of physics topics. In 2009 during a two-week long period data were recorded in order to study the Primakoff reaction by colliding a 190 GeV/c pion beam on a nickel target. A partial-wave analysis of this data allows to measure the absolute cross section of the reaction $\pi^-\gamma \rightarrow \pi^-\pi^0\pi^0$, which is predicted by chiral perturbation theory. The analysis of this reaction will be presented.

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