

HK 3: Elektromagnetische und Hadronische Sonden

Zeit: Montag 18:00–19:15

Raum: A

HK 3.1 Mo 18:00 A

New measurements of $\Delta G/G$ at COMPASS — •SUSANNE KOBLITZ — on behalf of the COMPASS Collaboration — Institut für Kernphysik, Universität Mainz, Becherweg 45, D-55099 Mainz

One of the main goals of the COMPASS experiment at CERN is the determination of the gluon polarisation in the nucleon, $\Delta G/G$. It is determined from spin asymmetries in the scattering of polarised muons at 160 GeV/c off a polarised LiD target.

The gluon polarisation is accessed by the selection of photon-gluon fusion events. Such events are tagged either with a charmed meson or a hadron pair with high transverse momenta in the final state. The selection of charmed mesons is based on the reconstruction of decayed D^* and D^0 mesons in the COMPASS spectrometer. For the high-pT hadron pairs two independent analyses are performed in the kinematic regimes of DIS ($Q^2 > 1(\text{GeV}/c)^2$) and quasi-real photoproduction ($Q^2 < 1(\text{GeV}/c)^2$).

For all three analysis the results for the data from 2002-2004 will be presented.

HK 3.2 Mo 18:15 A

Study of Λ polarisation at HERMES — •MARTIN RAITHEL for the HERMES-Collaboration — Physikalisches Institut, Universität Erlangen-Nürnberg, 91058 Erlangen, Germany

Longitudinal and transverse Λ polarisation have been measured at the HERMES experiment. The data were accumulated in the years 1996-2000 using the 27.5 GeV polarised HERA positron beam and polarised or unpolarised hydrogen and deuterium targets. The longitudinal spin transfer coefficient measured in the semi-inclusive deep inelastic scattering regime is compatible with zero in a wide range of the fractional Λ energy z . The transverse polarisation of Λ hyperons produced inclusively in quasi-real photoproduction is measured to be positive, in contrast to the negative values obtained with high-energy proton beams. This work was supported by BMBF, project Nr. 06 ER 125 I and 06 ER 243.

HK 3.3 Mo 18:30 A

Messung transversaler Spinstrukturen bei COMPASS — •ANSELM VOSSEN, HORST FISCHER, ROLAND HAGEMANN, WOLFGANG KÄFER, DONGHEE KANG, JASMIN KIEFER, KAY KÖNIGSMANN, ANDREAS MUTTER, FRANK NERLING, CHRISTIAN SCHILL, KONRAD WENZL und HEINER WOLLNY — Physikalisches Institut, Albert-Ludwigs-Universität Freiburg

Der Wirkungsquerschnitt der tief inelastischen Streuung (DIS) an Spin 1/2 Hadronen kann in führender Ordnung durch drei Quark Verteilungen $q(x)$, $\Delta q(x)$ und $\Delta_T q(x)$, parametrisiert werden. Im Gegensatz zur unpolarisierte Verteilungsfunktion $q(x)$ und der Helizitätsverteilungsfunktion $\Delta q(x)$ wird die Funktion $\Delta_T q(x)$ erst von aktuellen Experimenten gemessen. Hierbei handelt es sich um die transversale Spinverteilung, auch Transversity genannt. Am COMPASS Experiment am CERN wird $\Delta_T q(x)$ das erste Mal an einem Deuterium Target gemessen. Dies geschieht über den Collins Effekt in der Fragmentation, der in semi inklusiver DIS an einem transversal polarisierten Target beobachtet werden kann. Durch Teilchenidentifika-

tion kann daraus unter anderem die Transversity der down Quarks bestimmt werden. Zum erste Mal kann bei COMPASS auch der Sivers Effekt an einem Deuterium Target gemessen werden. Dieser transversale Spineffekt misst die Abhängigkeit der Bewegung der Quarks von der transversalen Polarisation des Nukleons. Deshalb lässt sich vom Sivers Effekt auch auf die Bahndrehimpulse der Partonen schließen. In dieser Präsentation werden neue Ergebnisse zu Collins und Sivers Effekt vorgestellt. Dieses Project wird vom BMBF unterstützt.

HK 3.4 Mo 18:45 A

Transversity signals in two hadron correlation at COMPASS — •FRANK MASSMANN — Helmholtz-Institut, Universität Bonn

COMPASS is a fixed target experiment on the SPS M2 beamline at CERN. Its target (^6LiD) can be both longitudinally and transversely polarized with respect to the polarized 160 GeV/c μ^+ beam. The transverse configuration allows the measurement of transversity effects. To fully specify the quark structure of the nucleon at the twist two level, three quark distribution functions must be taken into account: the spin averaged distribution function $q(x)$, the helicity distribution $\Delta q(x)$ and the transverse spin distribution $\Delta_T q(x)$. This last function, referred to as transversity, is chiral-odd and can only be measured in combination with another chiral-odd function. At COMPASS, $\Delta_T q(x)$ can be measured in semi-inclusive deep-inelastic scattering (SIDIS), requiring the detection of hadronic products. The measurement of two hadron production, introducing the chiral odd interference fragmentation function H_1 is considered as a new probe of the transverse spin distribution function $\Delta_T q(x)$. Results will be presented including particle identification by using the information of the RICH-detector. This work is supported by BMBF.

HK 3.5 Mo 19:00 A

Two-dimensional fitting procedure to extract asymmetries in SIDIS at COMPASS — •GIRISAN VENUGOPAL — Helmholtz - Institut für Strahlen und Kernphysik

COMPASS, a fixed target experiment on the SPS M2 beamline at CERN, has started to collect physics data from Autumn 2001 on a polarized ^6LiD target. This target can be both longitudinally and transversely polarized with respect to the polarized 160 GeV/c μ^+ beam. In 2002, 2003 and 2004, 20% of the beam-time was spent in the transverse configuration, allowing the measurement of transverse spin effects, predicted to give rise to numerous asymmetries in semi-inclusive DIS, related to the azimuthal angles of the target spin (ϕ_s) and the produced hadron (ϕ_h). To extract the full set of asymmetries simultaneously and to study the correlation between any chosen pair, two-dimensional fitting procedure was implemented. This method will be described and results will be presented for the Collins ($A_{UT}^{\sin(\phi_h + \phi_s - \pi)}$) and Sivers ($A_{UT}^{\sin(\phi_h - \phi_s)}$) asymmetries which were already published from one-dimensional fitting procedure, as well as other moments e.g azimuthal double spin asymmetry ($A_{LT}^{\cos(\phi_h - \phi_s)}$). The A_{LT} asymmetry arises due to the longitudinal polarization of quarks in the transversely polarized nucleon. The corresponding distribution function $g_{1T}(x, k_T^2)$ can be related to the ordinary helicity distribution function $g_1(x)$ measured in DIS. This work has been supported by the BMBF