

HK 81: Hadron Structure and Spectroscopy II

Time: Friday 11:00–12:45

Location: H-ZO 30

HK 81.1 Fr 11:00 H-ZO 30

The Strange Quark Polarisation from Inclusive and Charged Kaon Spin Asymmetries — ●REGINE PANKNIN for the COMPASS-Collaboration — Physikalisches Institut, Nussallee 12, 53115 Bonn

The polarisation of the strange quark in the nucleon, $\Delta s(x)/s(x)$, is - in leading order - derived from the spin asymmetry of charged kaons and the inclusive asymmetry A_1^d . The strange quark polarisation has been determined from the full sample of deeply inelastic scattering events on polarized deuterons collected at the COMPASS experiment at CERN from 2002 to 2006. These data made possible an extension of the $\Delta s(x)/s(x)$ analysis into the region of small x , down to $x = 0.004$. It will be shown that the significance of these results depends critically on the ratio of the s and u quark to kaon fragmentation functions, $\int D_s^{K^+}(z)dz / \int D_u^{K^+}(z)dz$.

HK 81.2 Fr 11:15 H-ZO 30

azimuthal asymmetries of the unpolarized cross-section at HERMES — ●FRANCESCA GIORDANO — INFN sez. ferrara, ferrara, italy

in unpolarized semi-inclusive deep inelastic scattering azimuthal $\cos\phi$ and $\cos 2\phi$ modulations of the hadron distributions originate from quark intrinsic transverse momentum and transverse spin.

these azimuthal modulations are extracted from data of the HERMES experiment corrected for instrumental and radiative contributions by a multidimensional $(x, y, z, P_{h\perp})$ unfolding procedure.

to access flavor dependent informations about quark intrinsic transverse momenta and spin-orbit correlations, results are presented for hydrogen and deuterium targets and separately for positive and negative hadrons. this flavor sensitivity of the results enhances the discrimination power between the theoretical models in the HERMES kinematical regime.

HK 81.3 Fr 11:30 H-ZO 30

HERMES measurements of the strange parton distribution and strange quark helicity distribution — ●POLINA KRAVCHENKO for the HERMES-Collaboration — PNPI, St.Petersburg, Russia

The helicity density of the strange quark sea in the proton has been extracted from measurements of polarized semi-inclusive production of charged kaons in deep inelastic scattering of positrons from a polarized deuteron target. The isoscalar nature of the deuteron target (assuming isospin symmetry) and lack of isospin for strange quarks allows the deuteron target to be used independently without relying on fragmentation models or other experimental data. In the region of measurement of $x > 0.02$ the helicity density is zero within experimental error and the measured first moment of the density is $0.006 \pm 0.029(\text{stat}) \pm 0.007(\text{sys})$. The first moment of the axial charge in the measured region is substantially less than that inferred from hyperon semi-leptonc decays.

HK 81.4 Fr 11:45 H-ZO 30

A-dependence of the Lambda polarization — ●YURY NARYSHKIN for the HERMES-Collaboration — PNPI RAS Gatchina, Leningrad district 188300, Russia.

The HERMES experiment has measured transverse polarization of Λ

and $\bar{\Lambda}$ hyperons produced inclusively at positron beam energy 27.6 GeV in quasi-real photon interaction with series of nuclei in a wide range of atomic numbers A ($^1H, ^2D, ^3He, ^4He, ^{14}N, ^{20}Ne, ^{84}Kr$ and ^{131}Xe). Dependence of the Lambda polarization on A is studied.

HK 81.5 Fr 12:00 H-ZO 30

Generalized Parton Distributions in Chiral Perturbation Theory — ●NIKOLAI KIVEL, MAXIM POLYAKOV, and ALEKSEY VLADIMIROV — Ruhr Universitet, Bochum

We used χ PT approach to study the small- t behavior of the Generalized Parton Distributions (GPDs). We demonstrate that in the region of Bjorken $x_{Bj} \sim m_\pi^2/(4\pi F_\pi)^2$ and/or $x_{Bj} \sim |t|/(4\pi F_\pi)^2$ the standard χ PT for the pion GPDs is not sufficient and one must perform all order resummation of χ PT. We develop the technique in order to sum the problematic contributions with the leading logarithmic accuracy. We apply this approach for the pion GPDs and compute their behavior at the region of small- x_{Bj} . Explicit resummation allows us to reveal novel phenomena – the form of the leading chiral correction to pion PDFs and GPDs depends on the small x asymptotic of the pion PDFs. In particular, if the pion PDF in the chiral limit has the Regge-like small x behaviour $q(x) \sim 1/x^\omega$, the leading large impact parameter ($b_\perp \rightarrow \infty$) asymptotics of the quark distribution in the transverse plane has the form ($m_\pi = 0$) $q(x, b_\perp) \sim 1/x^\omega \ln^\omega(b_\perp^2)/b_\perp^{2(1+\omega)}$. This result is model independent and it is controlled completely by the all order resummed χ PT.

HK 81.6 Fr 12:15 H-ZO 30

Vector meson form factors on the lattice — ●MARTIN GÜRTLER and PHILIPP HÄGLER — TU München

We compute form factors of vector mesons in lattice QCD. We use the QCDSF gauge field configurations with two dynamical flavors of non-perturbatively improved Wilson fermions.

In contrast to, e.g., the physical rho-meson, the vector mesons are stable on the lattice in the parameter ranges (pion masses and volumes) we consider.

Nevertheless, the results are exemplary for form factors of spin-1 particles, and can be compared to results for pion and nucleon form factors.

We will present results for the electromagnetic form factors that allow to derive the charge radius and the g-factor of the rho meson, and also the quadrupole moment, which describes deviations from the spherical shape of the meson.

We also present first results for axial vector form factors.

HK 81.7 Fr 12:30 H-ZO 30

The GDH Experiment on the Deuteron at MAMI — ●OLIVER JAHN for the A2-Collaboration — Institut für Kernphysik, Mainz

The GDH sum rule connects ground state properties of the nucleon with helicity dependent cross sections. To investigate these cross sections on the deuteron, experiments have been carried out in the A2-Collaboration at the Mainz Microtron, Germany, in 1998 and in 2003, using circularly polarised photons on a polarised d-butanol target. The latest analysis results and the status of the new GDH experiment with the Crystal Ball detector are reported.