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Measurement of longitudinal and transverse target polarization dependent azimuthal asymmetries in muon-p SIDIS processes at COMPASS

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COMPASS is a fixed target experiment located at the M2 beamline of the SPS accelerator at CERN. One of the most important objectives of the experiment is the study of the spin structure of the nucleon. Within the QCD parton model approach, the quark structure of the nucleon spin can be parametrized in terms of quark transverse momentum dependent (TMD) parton distribution functions (PDFs) while the hadronization mechanism is described by Fragmentation Functions (FFs). In the experiment, specific convolutions of the TMD PDFs and FFs can be accessed through the measurement of longitudinal and transverse nucleon-spin-dependent azimuthal asymmetries of charged hadrons produced in semi-inclusive deep inelastic lepton-nucleon scattering (SIDIS) processes. Between 2002 and 2011 COMPASS has performed a series of dedicated data-takings using 160-200 GeV/c polarized muons scattering off longitudinally or transversely polarized deuteron (${}^6\text{LiD}$) and proton (NH_3) targets. The whole set of target spin-dependent azimuthal asymmetries present in the SIDIS cross-section has been extracted.

In this talk recent COMPASS results obtained for proton spin-dependent azimuthal asymmetries will be presented along with former results obtained by other collaborations and relevant theoretical model predictions.

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