

Longitudinal Double Spin Asymmetry in Inclusive Neutral Pion Production at Forward Rapidities in $\sqrt{s}=62$ GeV Polarized pp Collisions at RHIC

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Polarized deep-inelastic lepton scattering experiments results revealed that only 20-30% of proton spin is contributed by the spin of the quarks. The remaining fraction of the proton's spin is carried by gluon spin and orbital angular momentum of quarks and gluons. High-energy polarized proton-proton collisions provide a direct probe of the gluon contribution through gluon-gluon and quark-gluon interactions. Longitudinal double spin asymmetry (A_{LL}) of identified particle production is a promising method for probing the gluon polarization (ΔG) in the proton.

PHENIX results on A_{LL} for neutral pion production in central rapidity region have proven the importance of this method and have placed constraints for ΔG at moderate x_F . In the year 2006 PHENIX commissioned a new high-resolution electromagnetic calorimeter, the Muon Piston Calorimeter (MPC), utilizing PbWO_4 crystals - the scintillator with the smallest known Moliere radius. The MPC covers 2π in azimuth and $3.1 < \eta < 3.65$ in rapidity and allows reconstruction of neutral pions with transverse momentum up to $p_T \sim 10$ GeV. It allows a study of π^0 production asymmetry at higher x_F , and therefore a larger range of constraint on ΔG can be made. In this talk, the status of the analysis on A_{LL} of π^0 at very forward rapidities in $\sqrt{s} = 62$ GeV polarized p+p collisions will be presented.