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Title: Cross Section and Double Helicity Asymmetry in Charged Hadron Production at $\sqrt{s} = 62.4$ GeV at PHENIX

Author(s): Christine A. Aidala

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CROSS SECTION AND DOUBLE-HELICITY ASYMMETRY IN CHARGED HADRON PRODUCTION AT $\sqrt{s} = 62.4$ GEV AT PHENIX

Christine A. Aidala for the PHENIX Collaboration

Los Alamos National Laboratory, Los Alamos, NM 87545, U.S.A.

The production of hadrons at large transverse momentum offers a classical test of perturbative QCD (pQCD). While cross sections for midrapidity particle production in $\sqrt{s} = 200$ GeV proton-proton collisions have been shown to agree well with next-to-leading order (NLO) pQCD calculations, a measurement by PHENIX of midrapidity neutral pion production in p+p collisions at $\sqrt{s} = 62.4$ GeV from 2006 data suggests that next-to-leading log (NLL) resummation may improve the agreement of theory with data. Measurement of the cross section for production of non-identified charged hadrons from this data set is sensitive to different fragmentation functions than the neutral pion measurement and will allow further comparison of pQCD calculations with data at an intermediate center-of-mass energy, as well as provide support for interpretation of the double-helicity asymmetry in charged hadron production. The double-helicity asymmetry measurement at this moderate energy provides sensitivity to ΔG , the gluon spin contribution to the spin of the proton, up to modestly larger values of the gluon momentum fraction, x , than previous RHIC measurements at 200 GeV. Analysis of the cross section and double-helicity asymmetry for production of non-identified charged hadrons at midrapidity in $p + p$ collisions at $\sqrt{s} = 62.4$ GeV for a transverse momentum range of 0.5–4.5 GeV/ c will be discussed.

Notes