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Illuminating QCD and Nucleon Structure Through the Study of Hadrons Within Jets at STAR JAMES DRACHENBERG, Lamar University, STAR COLLABORATION — The experiments of the RHIC spin program have provided critical insight into the spin structure of the nucleon, in particular shedding light on the roles played by gluon and sea-quark helicity. Over the last decade, theoretical and experimental engagement of transverse-spin phenomena have unlocked tantalizing opportunities for new insight into nucleon structure, e.g. with higher dimensions in partonic momentum space. STAR data collected in 2011 at $\sqrt{s} = 500$ GeV and 2012 at 200 GeV reveal the first observations of transverse single-spin asymmetries in the azimuthal distributions of hadrons within jets from polarized proton collisions. These data combined with measurements from deep inelastic scattering and recent phenomenological breakthroughs may illuminate longstanding questions: Do factorization and universality extend to the transverse-momentum-dependent (TMD) picture in proton+proton collisions, e.g. through the Collins mechanism? How do TMD functions evolve with changing kinematics?

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