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New Results from RHIC on the Spin Structure of the Proton

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In addition to accelerating heavy ion beams to ultrarelativistic energies, RHIC is the world's first polarized proton collider. It facilitates study of spin observables for hard partonic interactions tractable by perturbative QCD (pQCD), in order to extract information on the non-perturbative spin structure of the proton. The pp collisions offer distinct advantages and complementarity to deep inelastic lepton scattering experiments for the determination of the helicity preferences of gluons, the flavor-dependence of sea antiquark polarizations, and parton transverse motion or spin orientation preferences inside polarized protons. I will review the latest results from the RHIC spin program, with emphasis on measurements for the production in 200 GeV pp collisions of hadrons, jets, di-jets and direct photons. I will summarize the constraints implied by these results on the gluon contribution to proton spin and on the origin of transverse spin asymmetries. I will also briefly describe the near-term prospects for mapping the gluon polarization as a function of Bjorken x via coincidence measurements and for determining the flavor-dependence of sea-antiquark polarizations via W^\pm production.