

Recent results and future prospects of the STAR Spin Physics Program at RHIC at BNL

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The STAR experiment at the Relativistic Heavy-Ion Collider at Brookhaven National Laboratory is carrying out a spin physics program in the collision of both transverse and longitudinal polarized protons at $\sqrt{s} = 200$ GeV and eventually at $\sqrt{s} = 500$ GeV to gain a deeper insight into the spin structure and dynamics of the proton. These studies provide fundamental tests of Quantum Chromodynamics. The STAR detector is well suited for the reconstruction of various final states involving jets, π^0 , π^\pm , e^\pm and γ , which allows to measure several different processes.

One of the main objectives of the STAR spin physics program is the precise determination of the polarized gluon distribution function. Recent results will be shown on the measurement of the longitudinal double spin asymmetry A_{LL} for inclusive jet production, neutral pion production and charged pion production at $\sqrt{s} = 200$ GeV. In addition to those measurements involving longitudinal polarized proton beams, the STAR collaboration has performed several important measurements employing transverse polarized proton beams. New results on the measurement of the transverse single-spin asymmetry for forward neutral pion production and mid-rapidity di-jet production will be discussed.

Recent results and a brief account of future prospects of the STAR spin physics program will be presented.