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Transverse Spin at RHIC[1]

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In recent years, there has been exciting development in both experimental and theoretical studies of transverse spin asymmetries in polarized p+p and and DIS collisions. As a unique polarized proton-proton collider, Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL) provides a unique opportunity to investigate the novel physics mechanisms that cause the large single spin asymmetry at the forward rapidity. Both PHENIX and STAR experiments have been studying the transverse spin asymmetries with a variety of final state particles in different kinematic regimes since 2006. Especially, recent theoretical development on scattering a polarized probe on the saturated nuclear may provide a unique way to probe the gluon and quark TMDs. RHIC successfully ran polarized p+Au collisions in 2015. We will expect to have new results from polarized d+Au to compare with existing results from p+p collision to extend our understanding of QCD. Further more, In 2015, PHENIX installed MPC-ex calorimeter at very forward region to measure direct photon A_N and STAR installed Roman Pots to study the diffractive events in polarized p+p and p+Au collisions. The recent results on transverse polarized p+p and p+Au collisions from both PHENIX and STAR experiments will be presented in this talk. I will also briefly discuss the possibility for the transverse Spin program at future experiments sPHENIX and forward sPHENIX at RHIC.

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