Charged hadron measurements with first polarized proton collisions at PHENIX

Yuji Goto[a,b] for the PHENIX collaboration

[a] *RIKEN, Wako, Saitama 351-0198, Japan*
[b] *RIKEN BNL Research Center, Brookhaven National Laboratory, Upton, New York 11973-5000, USA*

The Relativistic Heavy Ion Collider at Brookhaven National Laboratory was operated as the first polarized proton collider in the 2001–2002 run. The polarized proton collisions were performed with transversely polarized proton beams at $\sqrt{s} = 200$ GeV, and we measured single transverse-spin asymmetries of many channels with the PHENIX detector. Charged hadrons in the mid-rapidity region were detected in the PHENIX central arms with a minimum-bias trigger at low p_T with particle identification, and with a calorimeter trigger at high p_T.
The yields of charged hadrons at high energy allow us to study parton structure in the proton and fragmentation to final particles in the transverse direction, especially with respect to higher-twist effects, transversity, and k_T effects.
In the future with longitudinally polarized proton beams, we will observe double longitudinal-spin asymmetries, which are sensitive to the polarized structure of the proton, especially the gluon polarization.
In this talk we present our measurements of yields and single transverse-spin asymmetries of the charged hadrons in this run, and discuss sensitivities to the physics in this and coming runs.