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**Measurement of the single transverse-spin asymmetry of forward neutrons in p-p collisions at RHIC-PHENIX** MANABU TOGAWA, Kyoto University, PHENIX COLLABORATION — The Relativistic Heavy Ion Collider (RHIC) at the Brookhaven National Laboratory (BNL) has been operated with polarized proton beams colliding at the center of mass energy  $\sqrt{s}=200$  GeV. In the RUN2 (2001-2002), a large single transverse spin asymmetry  $A_N$  (-10%) of the forward neutrons measured at the 12 o'clock interaction point experiment. In the ISR experiment, it is  $\sqrt{s}=30.6$  to  $62.7$  GeV in p-p collisions, the cross-section of forward neutron production was measured to be larger than at mid-rapidity. Our understanding of this effect is based on pion exchange. The forward neutron asymmetry can shed new light to understand such forward physics. Through the 2003-2005, PHENIX experiment has measured the forward neutrons by ZDC(Zero Degree Calorimeter) with SMD(Shower Max Detector) which is position sensitive detector. The energy resolution of ZDC is twice better than that of the hadron calorimeter which was used in the 12 o'clock experiment. In this talk, we will report the measurement of neutron asymmetry by the PHENIX experiment and discuss the physics implication of the neutron asymmetry.

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