

Abstract Submitted  
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**Spin Effects in Forward Pion Production** LEN EUN, Penn State University, STAR COLLABORATION — This talk summarizes STAR measurements of forward  $\pi^0$  meson production at  $\sqrt{s} = 200$  and 62 GeV from polarized proton collisions at the Relativistic Heavy Ion Collider (RHIC). Measurements show that analyzing power ( $A_N$ ) is an increasing function of  $x_F$  at  $x_F > 0.3$  and consistent with zero at  $x_F < 0$ . Contrary to theoretical predictions,  $A_N$  does not decrease monotonically with increasing  $p_T$ . The unpolarized  $\pi^0$  cross-sections measured at  $\eta = 3.3, 3.8$  and 4.0 are consistent with next-to-leading order pQCD calculations. The Forward Pion Detector (FPD) was expanded to FPD<sup>++</sup> in 2005. The improved acceptance of FPD<sup>++</sup> combined with 6.8 pb<sup>-1</sup> integrated luminosity and 60% average beam polarization of the RHIC run 2006 provides the necessary statistics to measure  $A_N$  precisely as functions of  $x_F$  and  $p_T$ , and measurements of other spin observables. A further expansion to Forward Meson Spectrometer has been carried out, which will provide complete electromagnetic calorimeter coverage for  $-1 < \eta < +4$  in conjunction with the existing STAR Endcap and Barrel calorimeters. This will allow for the discrimination between the Collins and Sivers effect as the origin of transverse single spin effect in the forward region.

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