

Abstract Submitted  
for the DNP13 Meeting of  
The American Physical Society

**Using  $\pi^0$ 's to Understand Proton Spin Structure through Polarized p+p Collisions at  $0.8 < \eta < 2.0$  and  $\sqrt{s} = 200$  GeV at STAR** STEPHEN PLACE, Valparaiso University, STAR COLLABORATION — Measurements of spin dependent observables at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory provide unique insight into the contribution of a proton's constituents to its spin. The Solenoidal Tracker at RHIC (STAR) can be used to measure effects of the quark and gluon spins in the proton by observations of neutral pions that result from longitudinally and transversely polarized proton-proton collisions in STAR. The neutral pions ( $\pi^0$ 's) decay into two photons that, for  $0.8 < \eta < 2.0$ , can be observed in the endcap electromagnetic calorimeter in STAR. These are used to reconstruct the kinematic properties of the  $\pi^0$ 's and we can then look for spin asymmetries in  $\pi^0$  production. Measurements of both the longitudinal and transverse spin asymmetries in the production of  $\pi^0$ 's from data taken in 2006 have made some contributions to our understanding of the structure of the proton. New data taken in 2009, in a longitudinal spin run with greater luminosity, will provide greater precision to the final results. Results from 2006 and preliminary work on 2009 data will be shown.

Stephen Place  
Valparaiso University

Date submitted: 01 Aug 2013

Electronic form version 1.4