

Abstract Submitted  
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**Single Spin Asymmetry Measurement for  $W$ -Boson Production in Longitudinally Polarized  $p+p$  Collisions at  $\sqrt{s} = 500$  GeV in PHENIX**  
YOUNG JIN KIM, University of Illinois at Urbana Champaign, PHENIX COLLABORATION — One of main physics thrusts at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL) is to understand the origin of proton spin structure. Parity violating single spin asymmetries for  $W^\pm$ -bosons in longitudinally polarized  $p+p$  collisions at  $\sqrt{s} = 500$  GeV will give access to the flavor separated quark and anti-quark polarizations in the proton. The PHENIX experiment has measured  $A_L$  for electrons from  $W$ -decay with its central arm spectrometers and will measure muons from  $W$ -decay with its forward muon spectrometers. Cross sections for  $W^\pm$ -bosons and the corresponding single spin asymmetries for  $e^\pm$  in the central arms will be shown for the run 2009 data sample. The current status of the muon measurements from  $W^\pm$  decays in muon arms during RHIC Run-11 will be presented.

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