Pi0 measurements in polarized proton collisions from PHENIX at RHIC

The RHIC is the first polarized proton collider, and has just completed the first physics run, at root(s)=200 GeV, in January 2002. It provides a unique opportunity to study the spin structure of the nucleon. PHENIX is one of the major detector systems at RHIC. Pi0's are a very important probe in PHENIX spin program. Pi0 yield asymmetry in longitudinally polarized proton collisions gives an access to the gluon polarization in proton. Single-transverse spin asymmetry measurements with pi0's are another aspect to study spin structure of the nucleon. PHENIX obtained first data from vertically polarized proton collisions (peak polarization about 25%). Pi0 pt spectra measured in proton collisions at sqrt(s)=200 GeV will be presented and compared to earlier experiments. We will also discuss our first results on single-spin asymmetry measurements with neutral pions at mid-rapidity with sensitivity and pt range considerably higher than in previous polarized proton experiments.