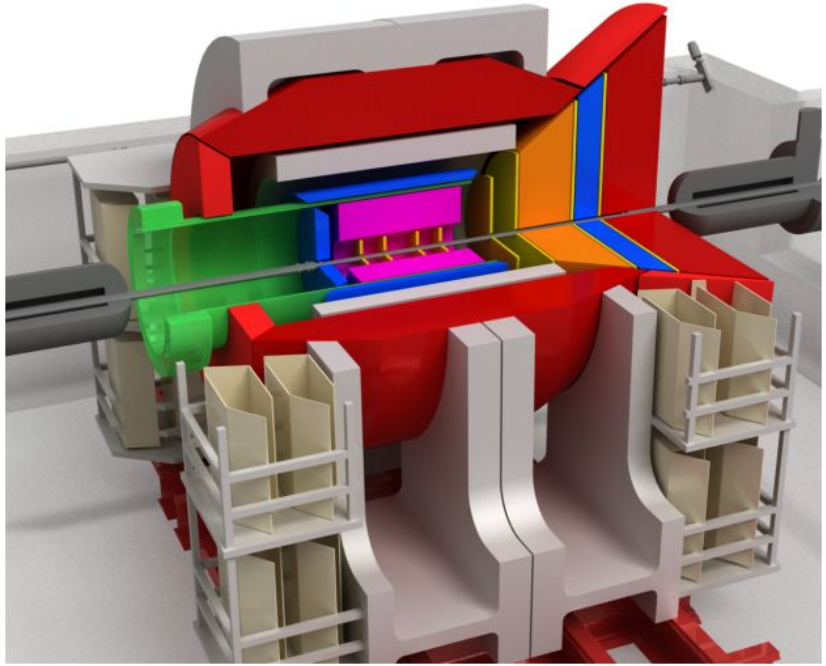
# DIS Studies Using Pythia 6



March 13, 2017

Thomas Krahulik (Stony Brook University)

# Pythia Study Updates

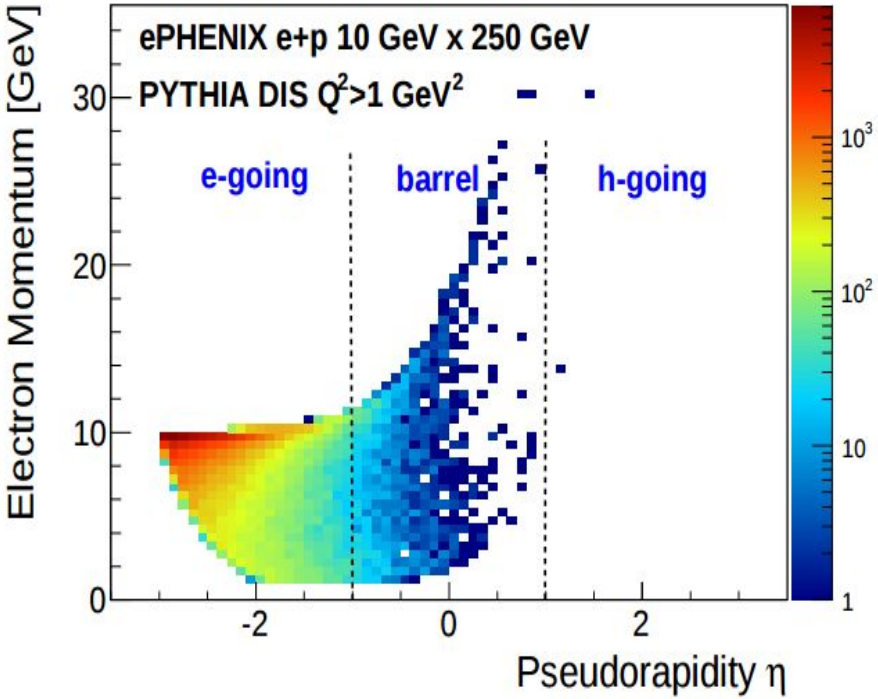
Several new undergraduates joining work on EIC detector simulations!

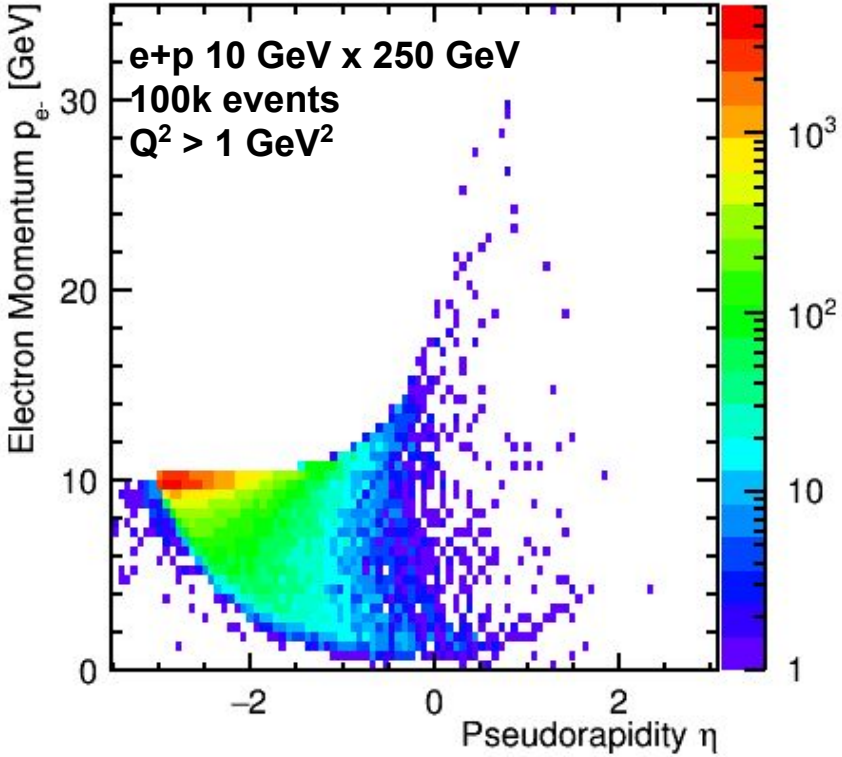
Goal: Study EIC detector performance and acceptance in Geant4

First Step: Studying e-p collisions using Pythia6

Current Method: Standalone simulation using ROOT TPythia6

# LoI Figure 2.1: Electron Momentum vs. Pseudorapidity



# LoI Figure 2.7: Hadron Momentum vs Pseudorapidity

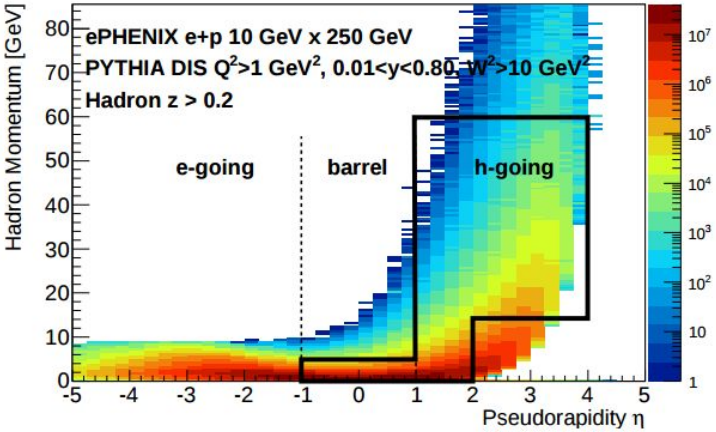
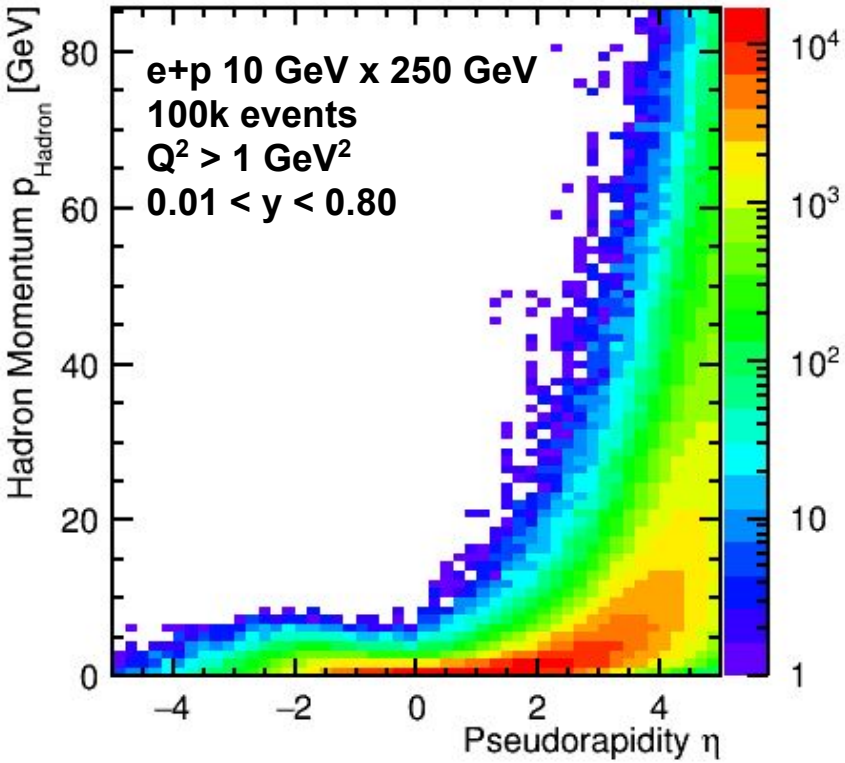
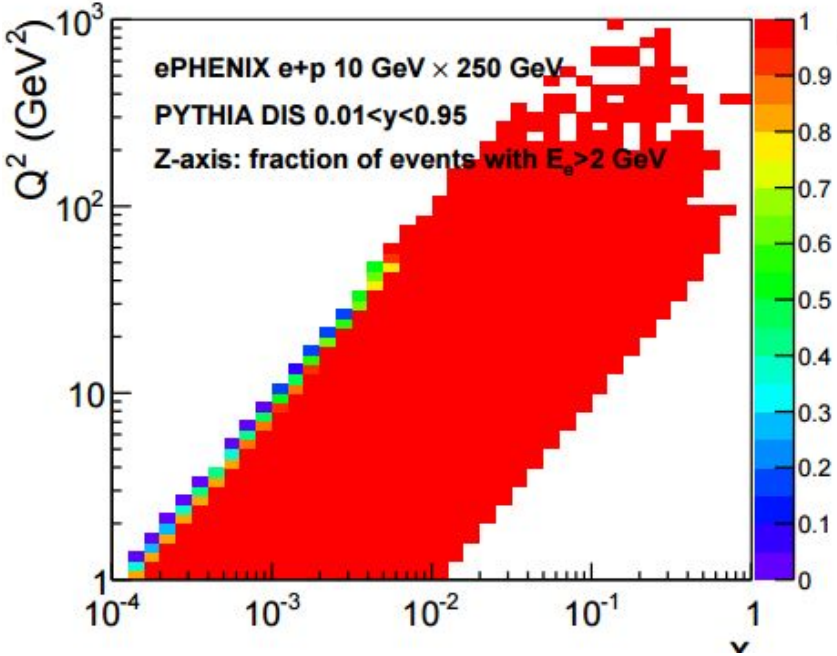
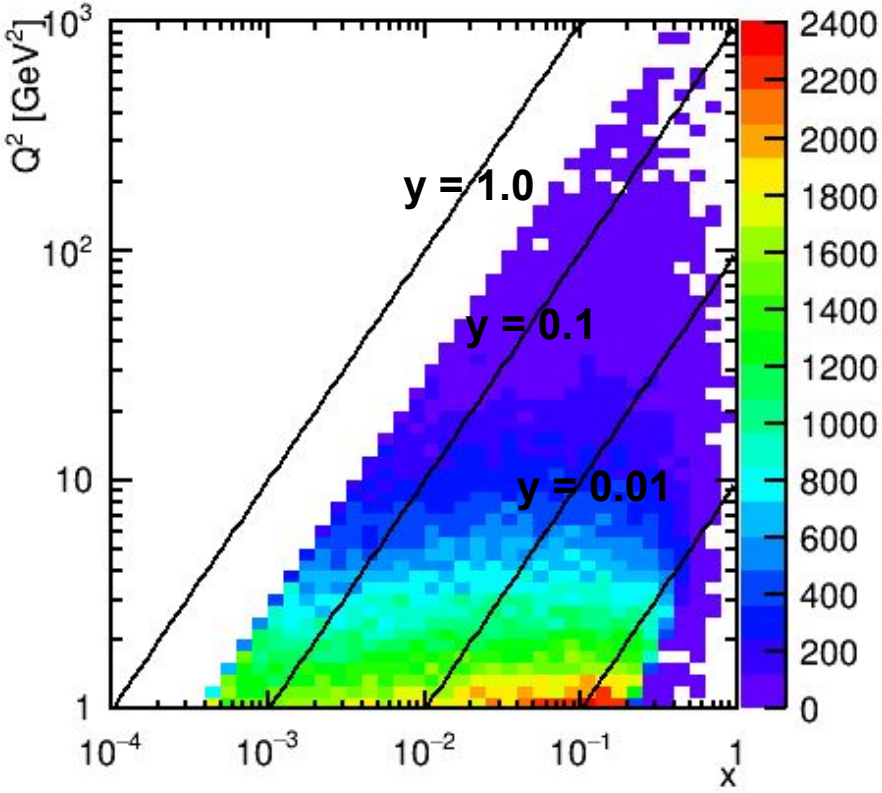



**Figure 2.7:** Shown is the distribution of hadrons from DIS events in $e+p$ as a function of momentum and pseudorapidity, based on PYTHIA simulations of the 10 GeV × 250 GeV beam energy configuration. The black outline indicates the pseudorapidity and momentum range covered for kaons by the planned PID detectors in ePHENIX.



# LoI Figure 2.4: $e^-$ Distribution in x-$Q^2$ Space



# Next steps...

1. Implement same PDF used for LoI
   - Requires LHAPDF
2. Develop Fun4All module for e-p collision analysis from PHPythia6
   - Currently using standalone ROOT TPythia6 simulation to generate data files
3. Other physics studies…
   - DVCS, DVMP

Questions?