Angular Dependence
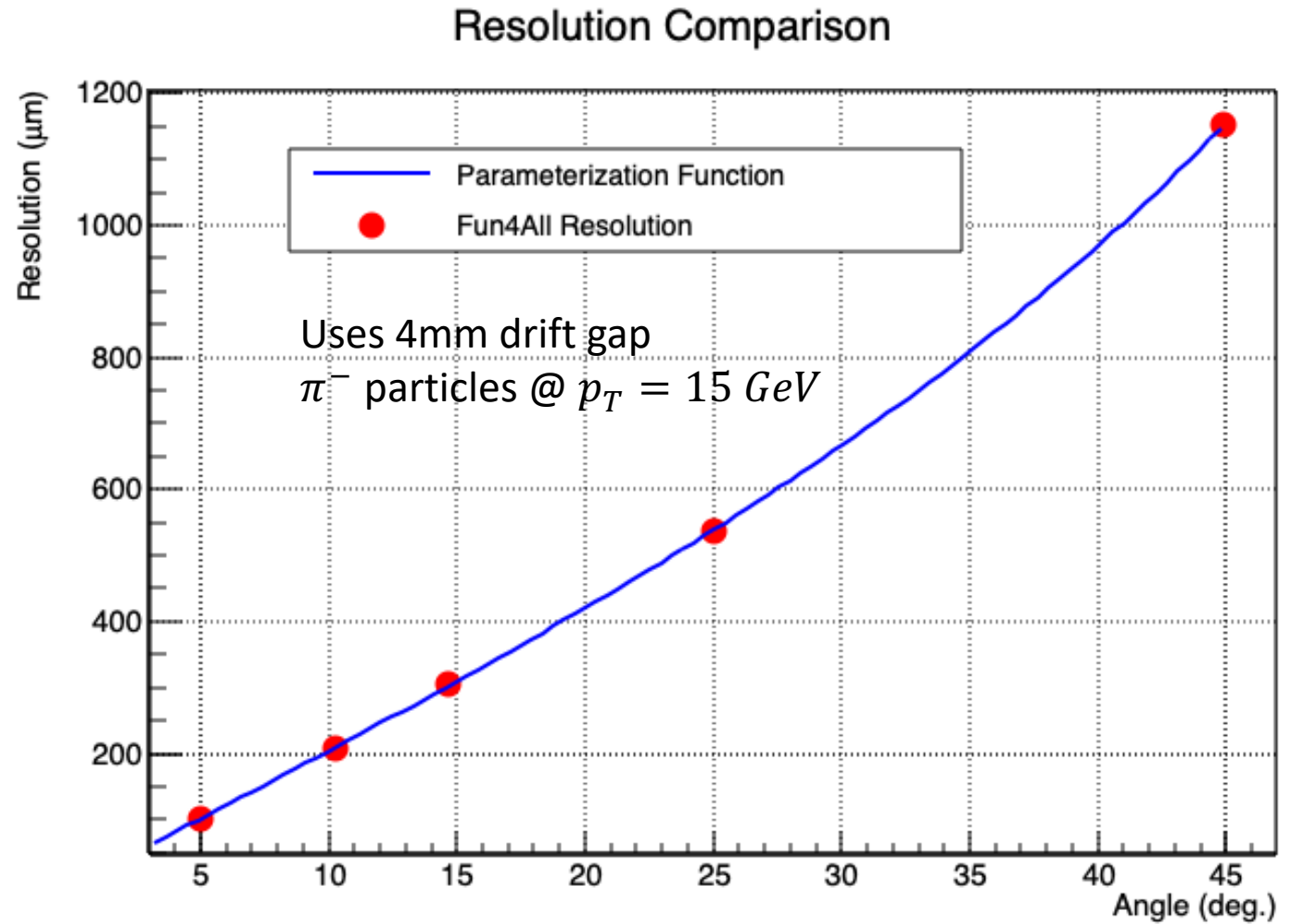
➤ Parameterization Function:

$$\sigma_\theta = \sqrt{\frac{L^2}{12}\tan^2\theta}$$

  ○ L = drift gap (studies assume 4 mm gap)

➤ Uses momentum information from hit point on MPGD layer to determine angle
  ○ Modifies PHG4TrackFastSim.cc
  ○ $\theta = \sin^{-1}\left(\frac{p_T}{p}\right)$

Resolution Comparison

Uses 4mm drift gap
π^- particles @ $p_T = 15\ GeV$

1

Simulation Setup

- ➤ Particle Generation:
  - ○ SIMP generator
  - ○ π^- particles thrown uniformly over $0.0 < p_T < 20.0$ and $0.0 < \eta < 1.0$
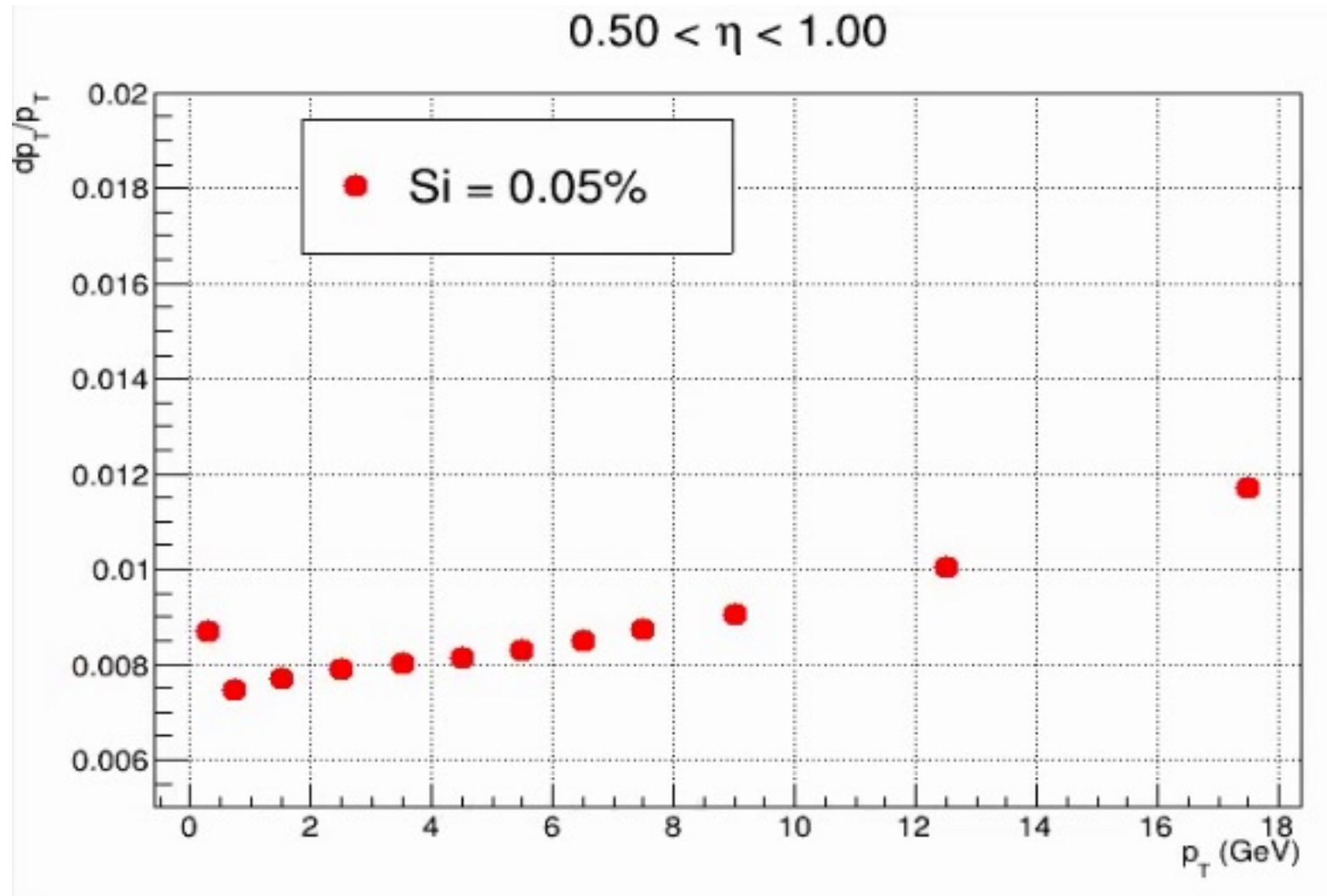
- ➤ Detector Layout
  - ○ B = 1.4 T
  - ○ Beam pipe
  - ○ Barrel supports/service
  - ○ DIRC
  - ○ Si vertex layers
  - ○ Si sagitta layers → modified to 0.55% X_0
  - ○ MPGD layers (4 mm drift gap)
  - ○ TOF layers
  - ○ Si disks
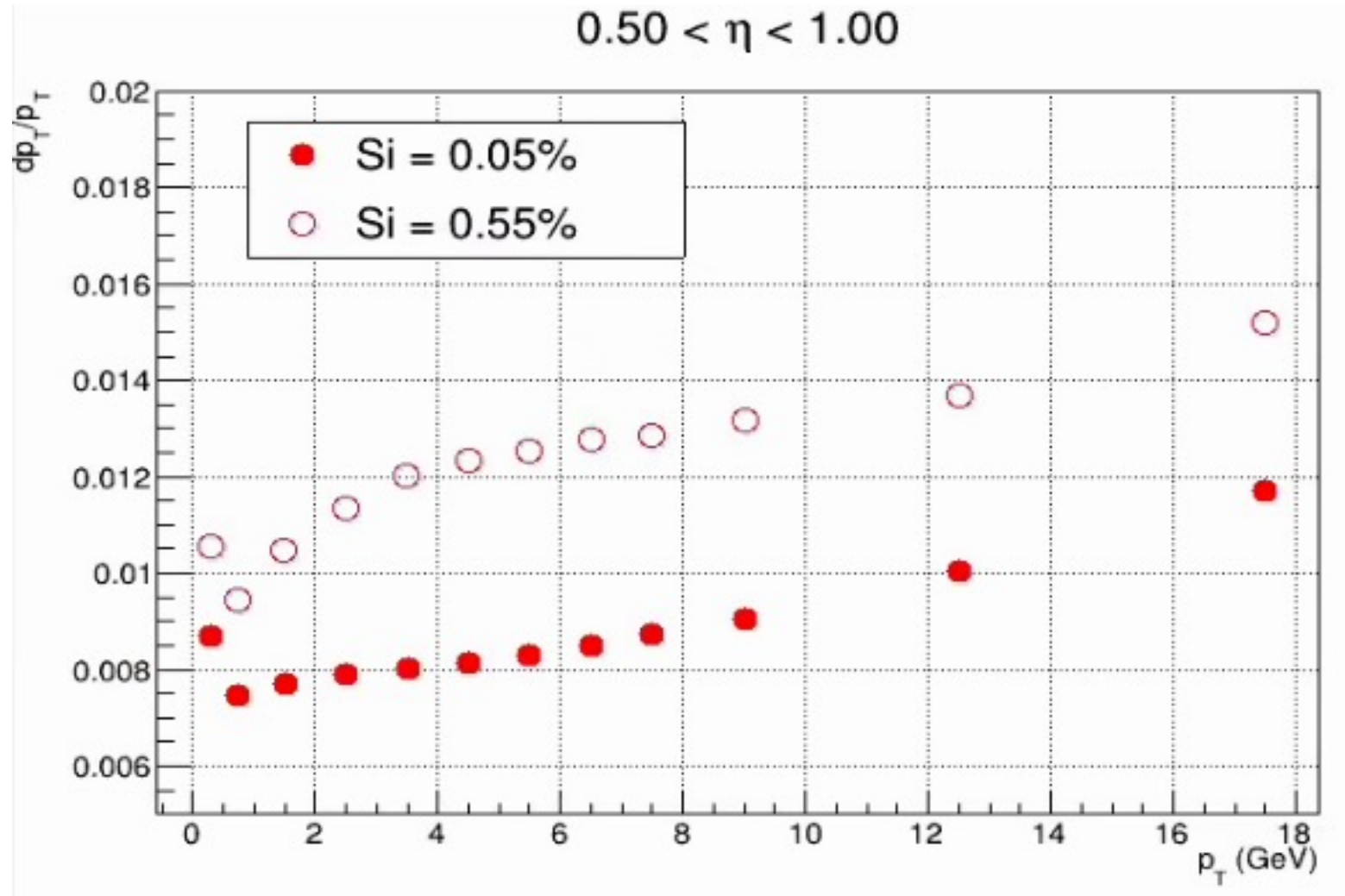

- ➤ MPGD Resolution Value Comparisons:
  1. ECCE setting using fixed resolutions: lonres = phires = 55 μm
  2. Extreme setting using fixed resolutions: lonres = phires = 1155 μm
  3. Angular dependence resolution: lonres = angle dependent, ranges $55\mu m - \sim 1155\ \mu m$, phires (fixed) = $55\mu m$
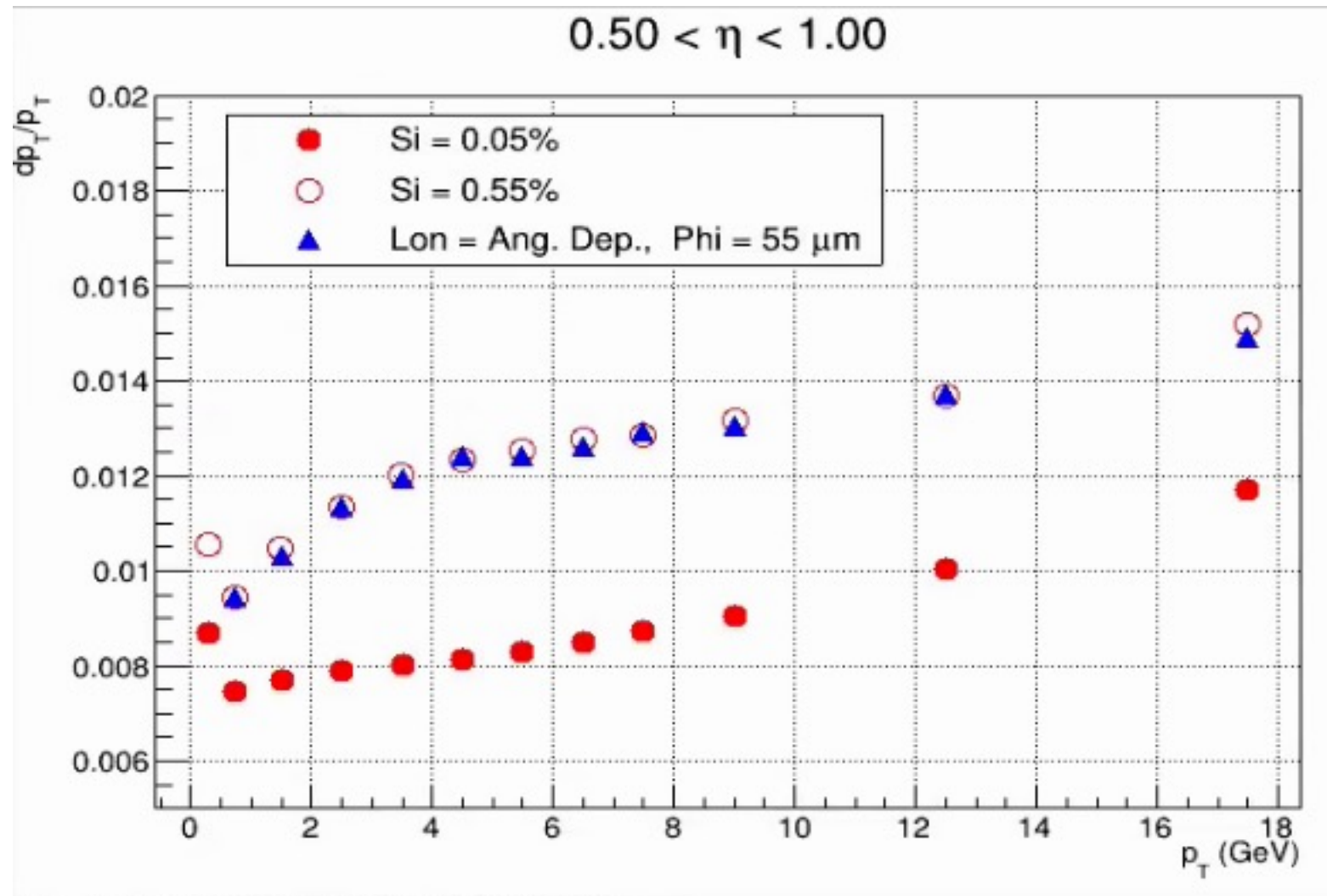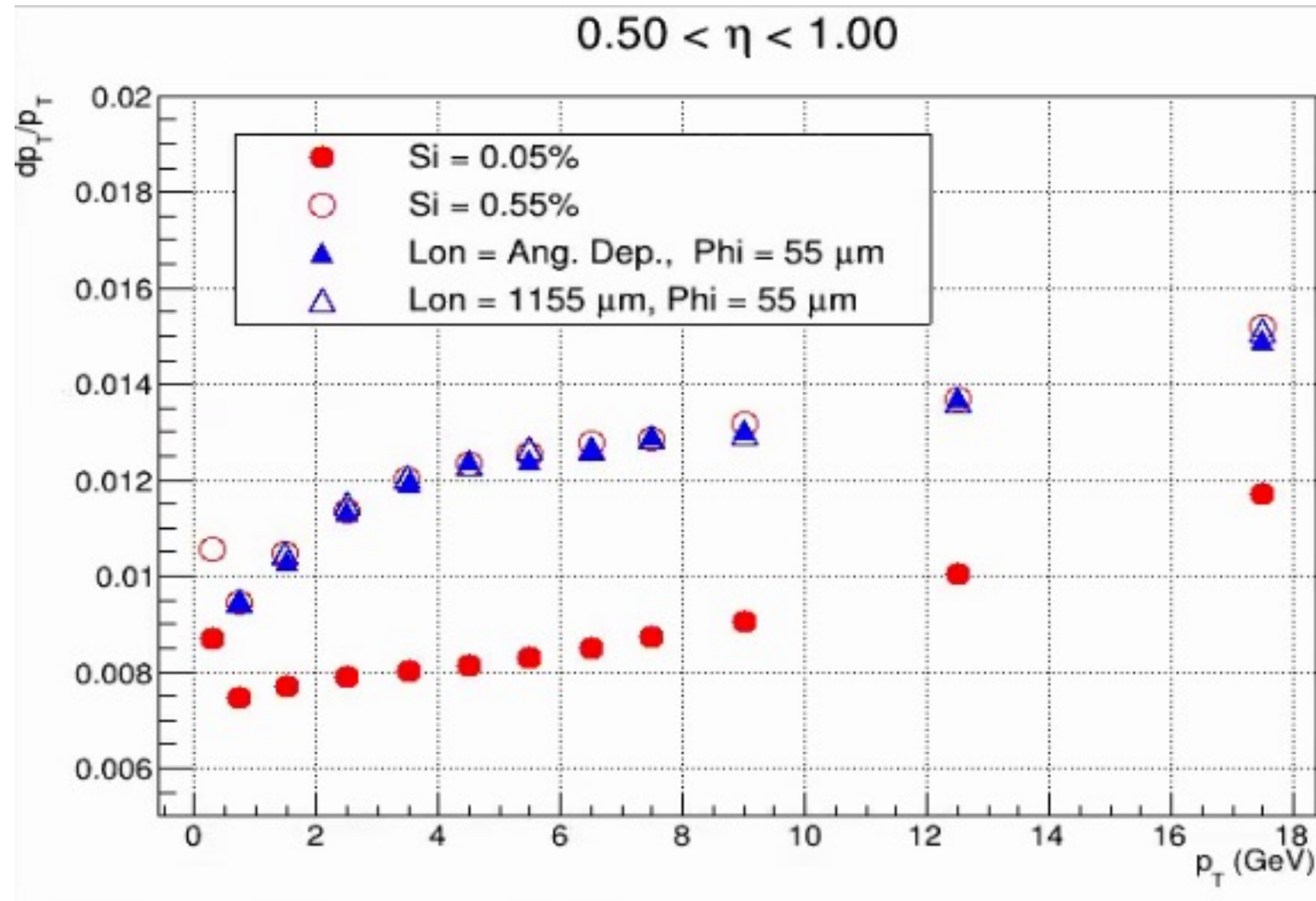
Resolution Comparisons

$$0.50 < \eta < 1.00$$

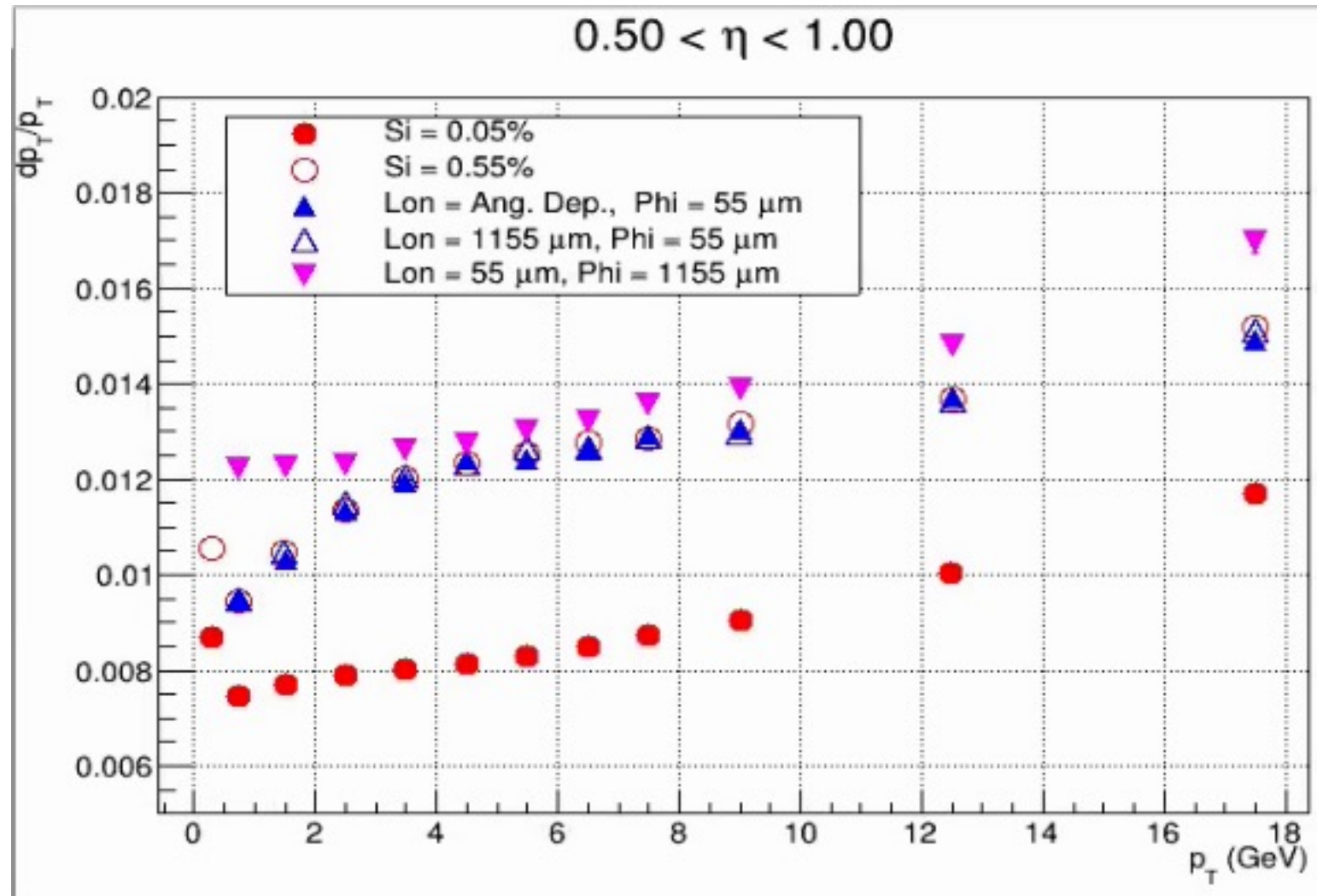# Resolution Comparisons

0.50 < η < 1.00

Resolution Comparisons

Resolution Comparisons

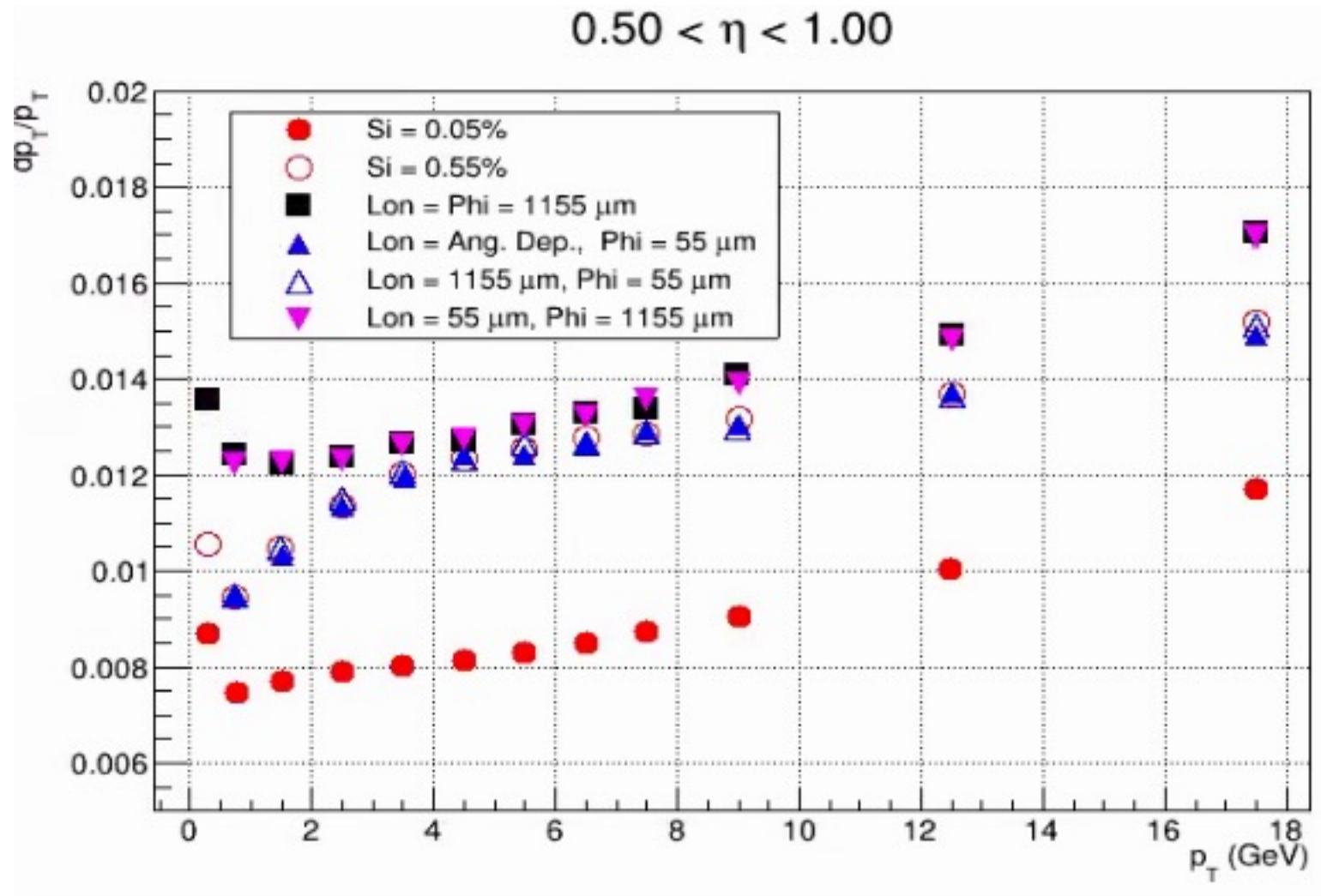# Resolution Comparisons

Resolution Comparisons

Resolution Comparisons