EIC Residuals

EIC LBL meeting updates
6 February 2024

Beatrice Liang-Gilman

Updates

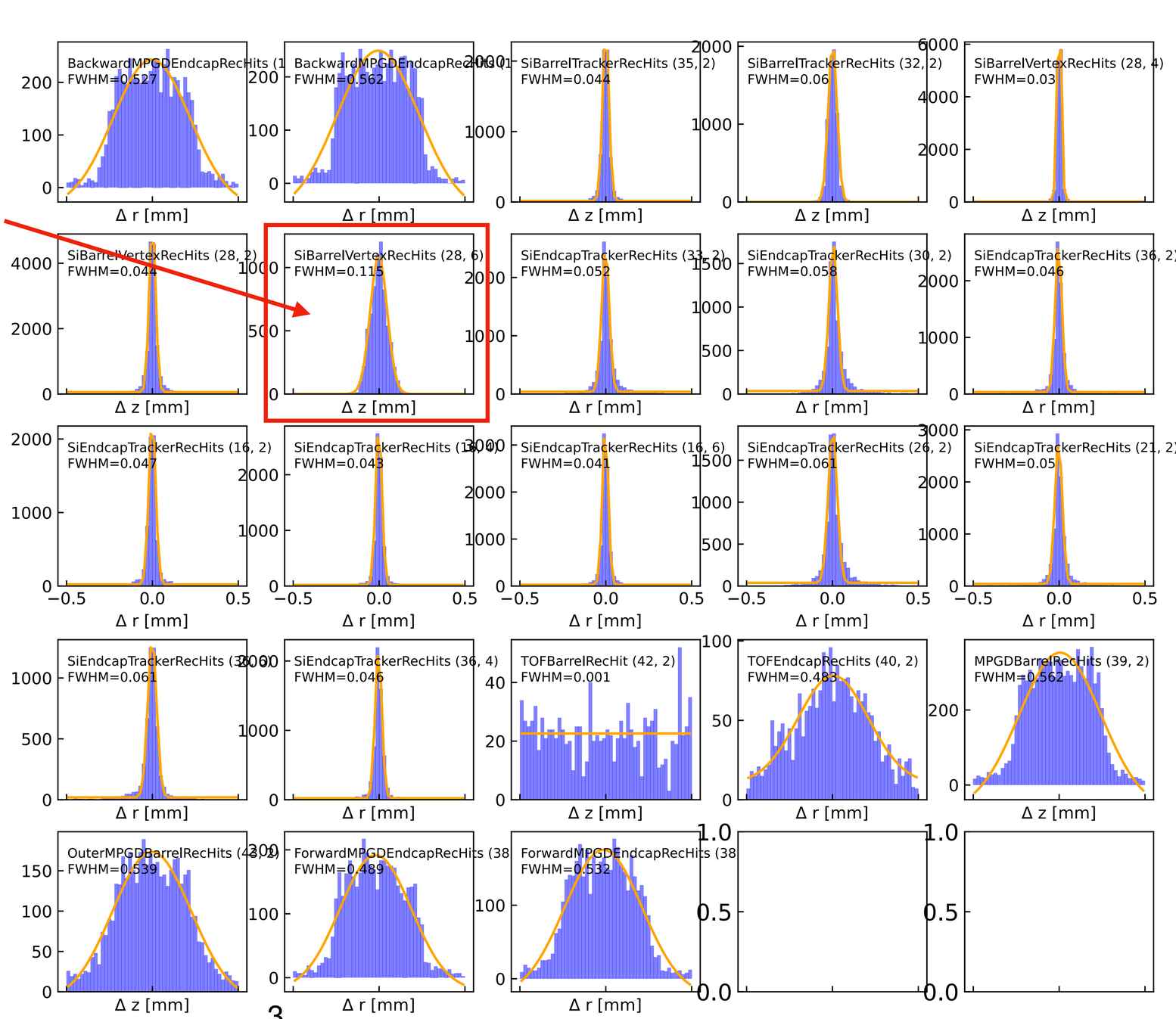
- Pulled the latest version of EICrecon (2/1/2024)
- Implemented realistic seeded Central Track Segments
- Generated reconstructed events for ±muons with the full reconstruction and just the silicon layers
  - momentum: 0.5 - 20 GeV, eta: uniform between -4.0 - 4.0

Residuals

per layer

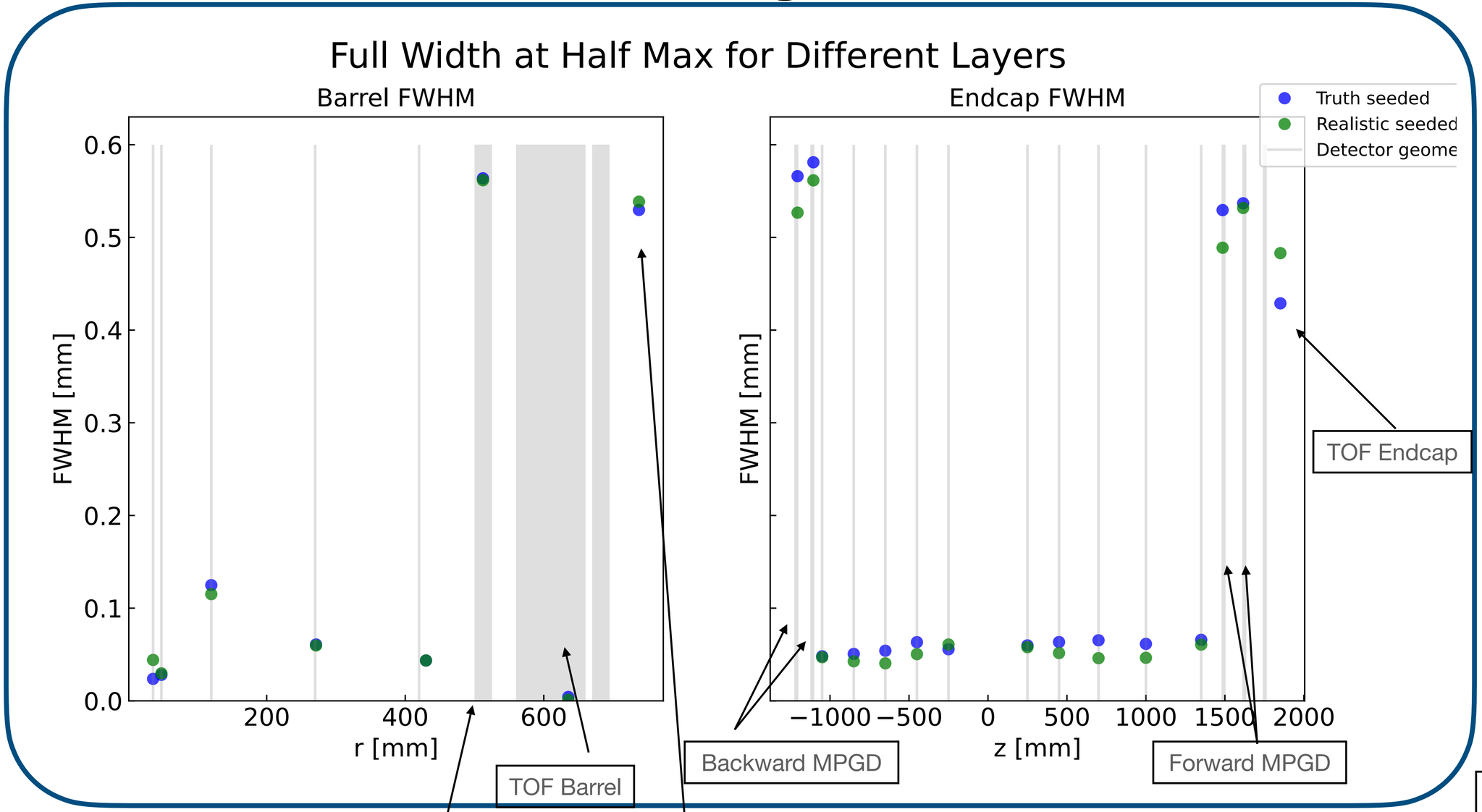
- Realistic seeded, μ-
- MPGD residuals now look centered around 0
- Outer MPGD layer no longer missing hits
- Silicon peaks range from a FWHM of 30 - 115μm
  - (compared to truth seeded: FWHM ranges from 24 - 125 μm)

Silicon L2



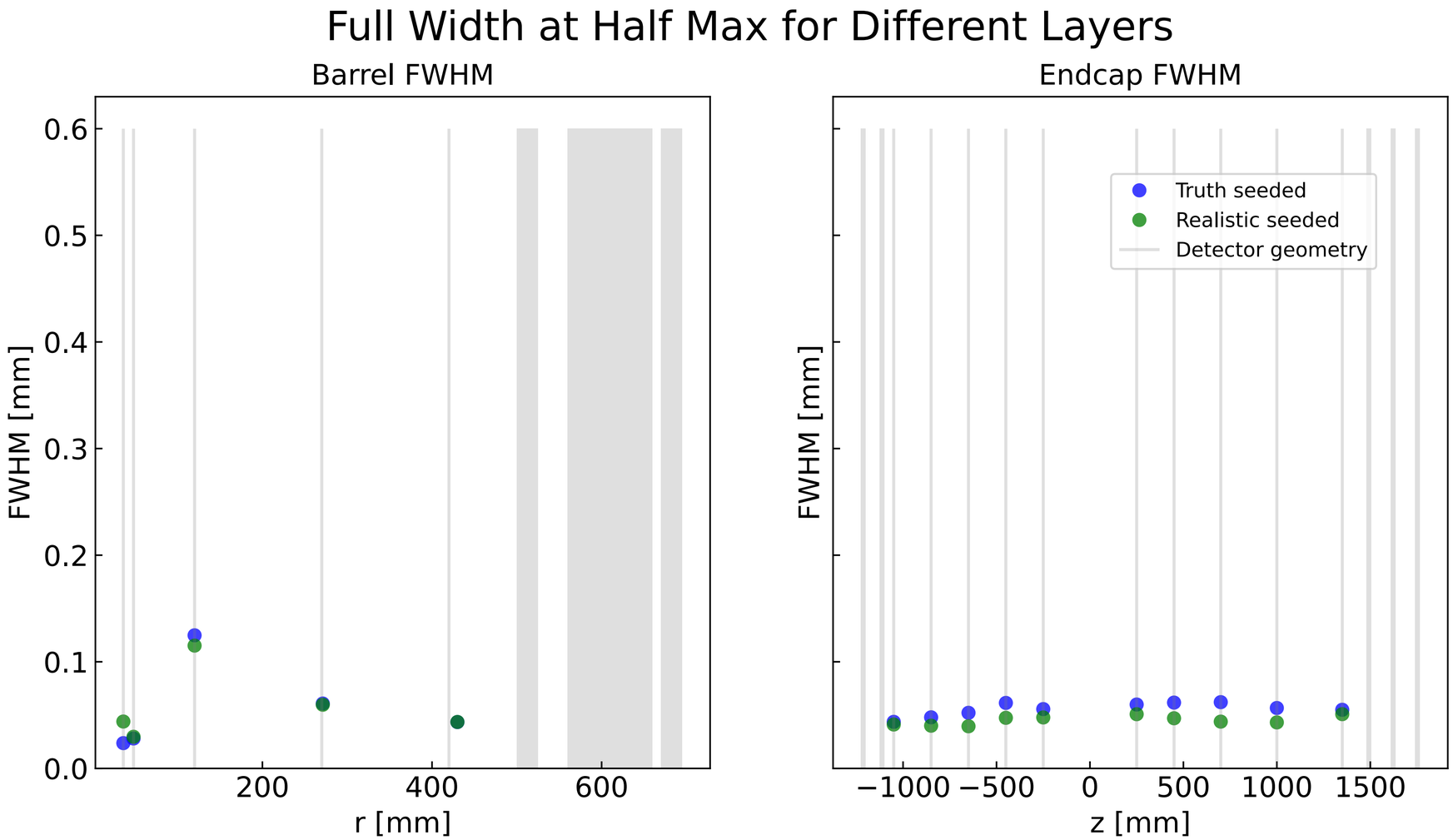
FWHM at different layers

*See different TOF endcap coordinates at: https://eic.jlab.org/Geometry/Detector/Detector-20231031150001.html



Single μ-,
full reconstruction

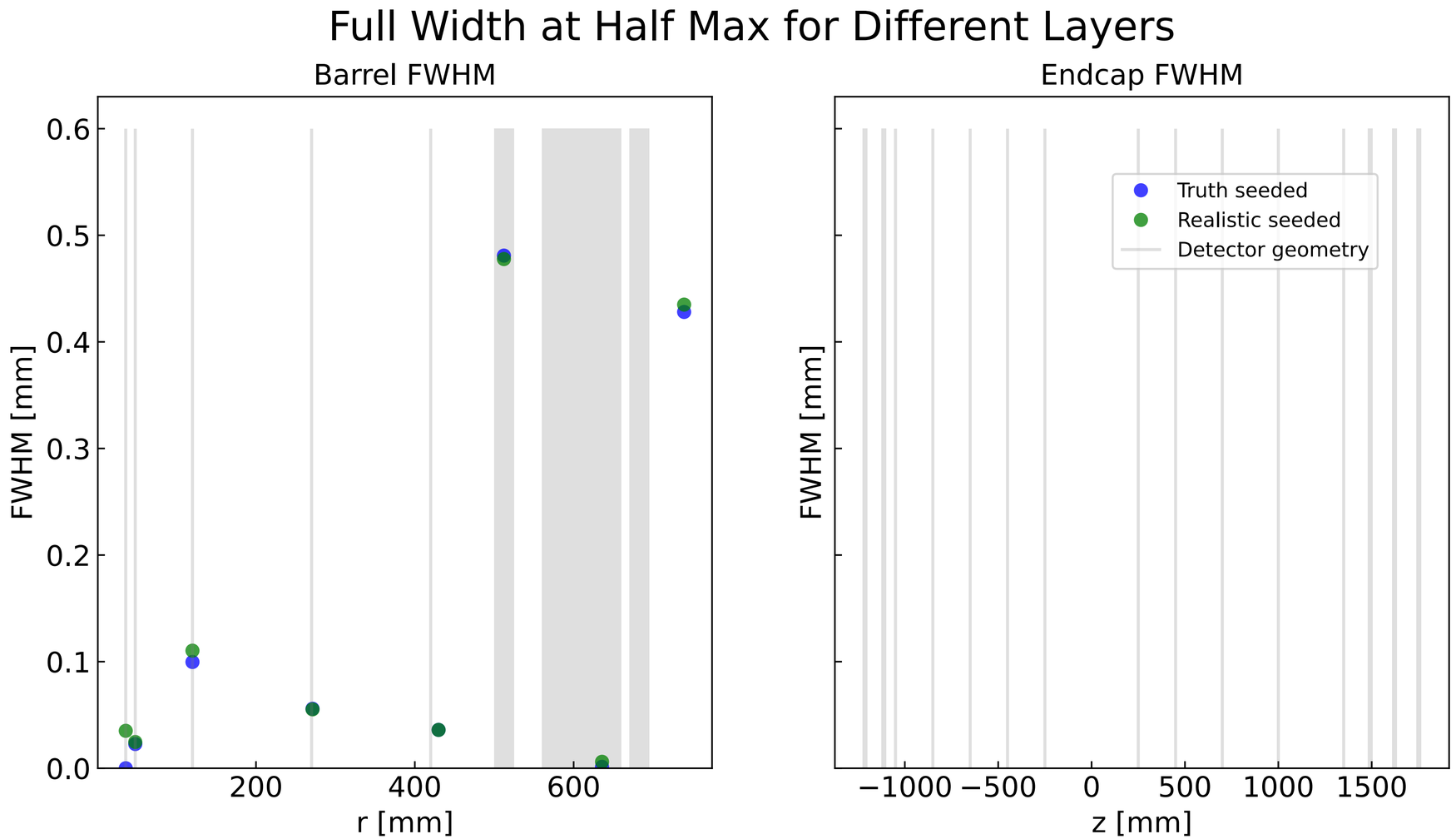
FWHM at different layers



- Not much changed

Single μ-, silicon only reconstruction

FWHM at different layers



- Only looked at muons that were in the range of 85°<θ<95°

Single μ-, full reconstruction

Summary and Next Steps

- Truth & realistic seeded residuals are now easily calculated
- Current tracking algorithm appears to be insensitive to the MPGD/TOF layers based on the residuals
- Need to figure out why silicon L2 is worse than the other layers.
- Make unbiased residuals
  - Some functionality in ACTS to do this:
    - https://github.com/acts-project/acts/commit/c21fc44fbe914473e13880da58798f13dfd542a5
- Run all residuals with DIS events