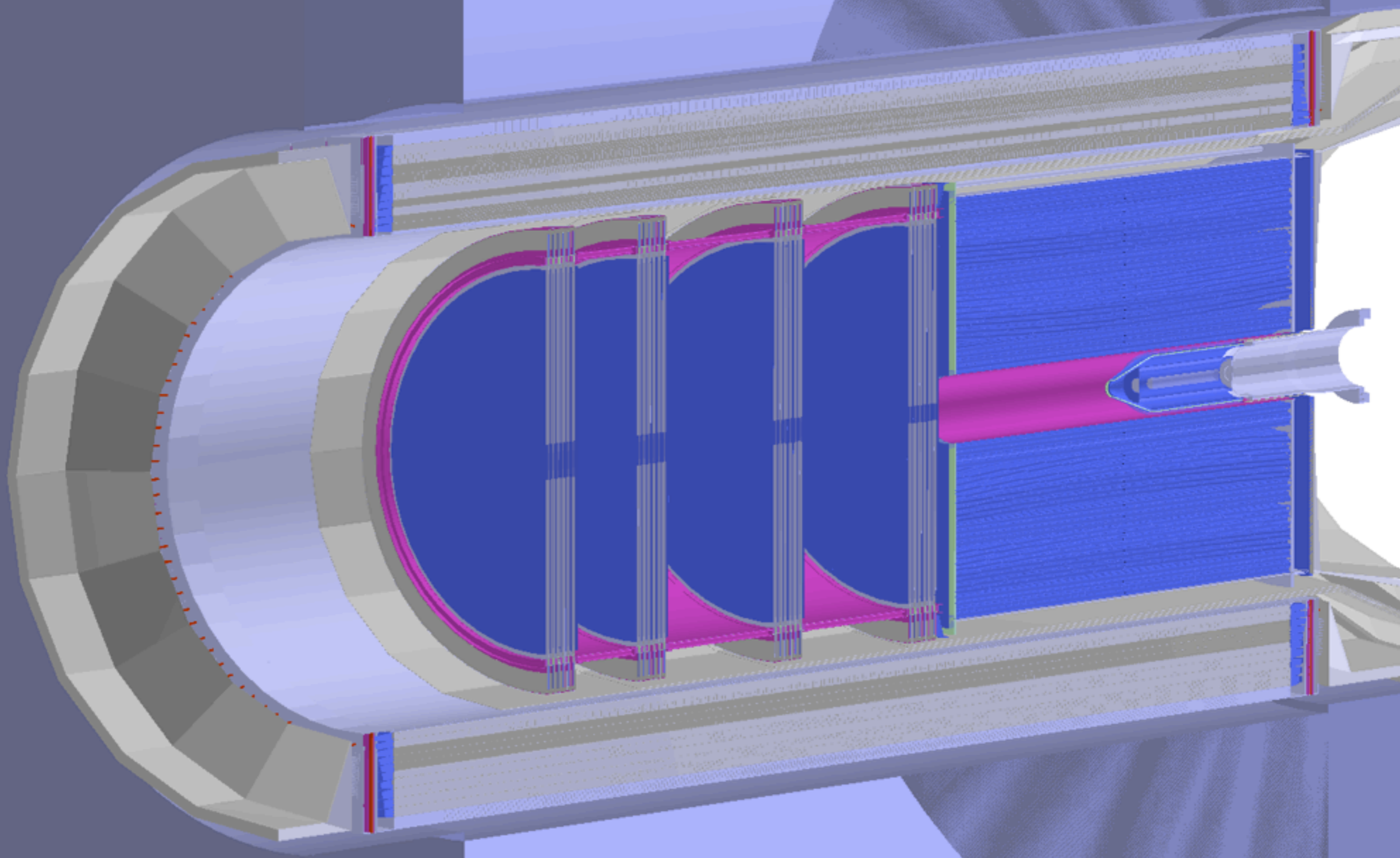


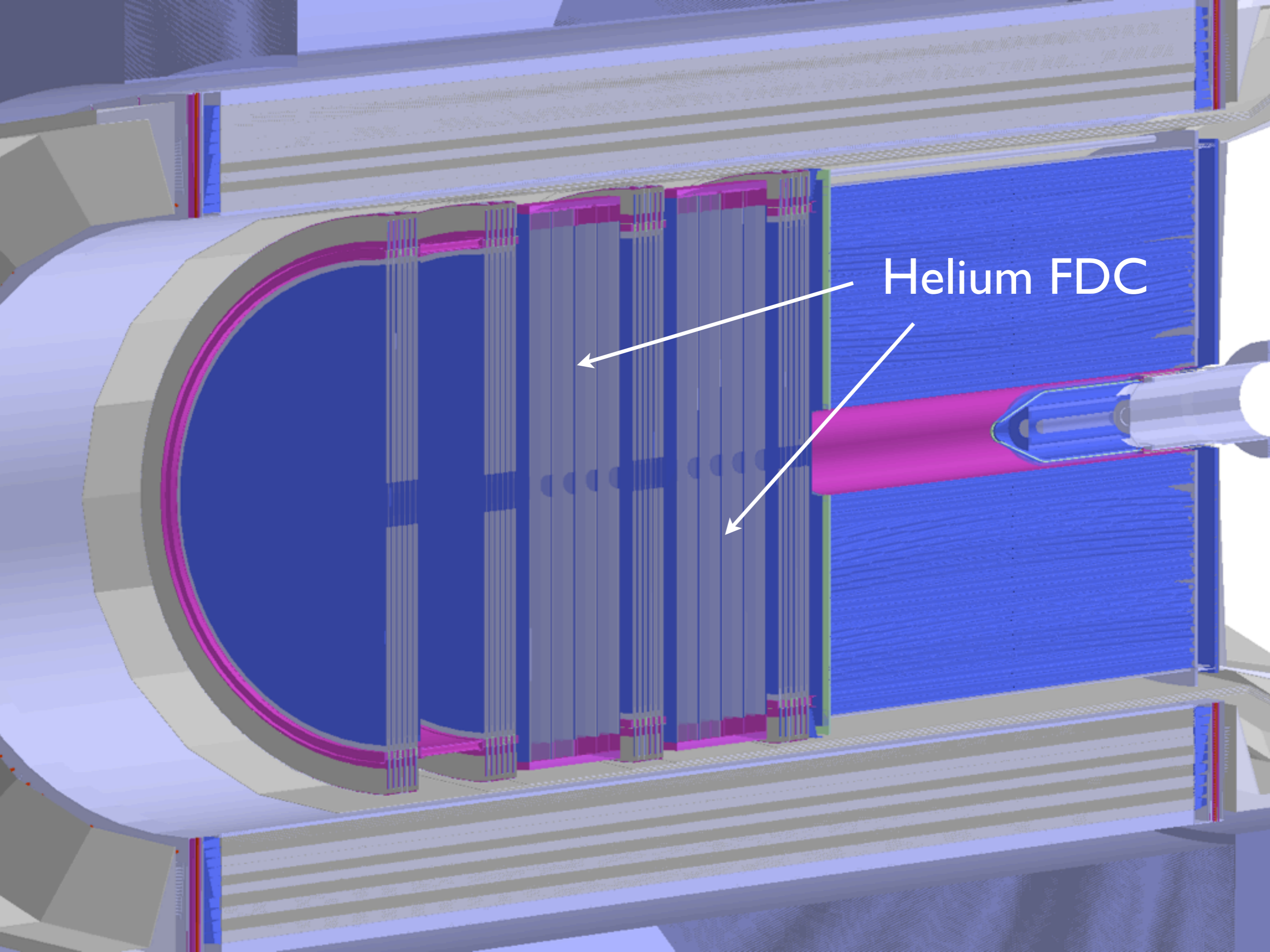
Photon Detection Efficiency

- Study photon detection efficiency for various PID options
 - “default”: baseline GlueX
 - original gas Cherenkov
 - cluster counting “Helium FDC”
 - no XML geometry yet for other options
- Single photon gun
 - uniform in polar angle from 0-30 degrees
 - uniform in energy from 0-2 GeV
- *Preliminary!* More sophisticated study ongoing -- work with IU undergrad Tom Boettcher



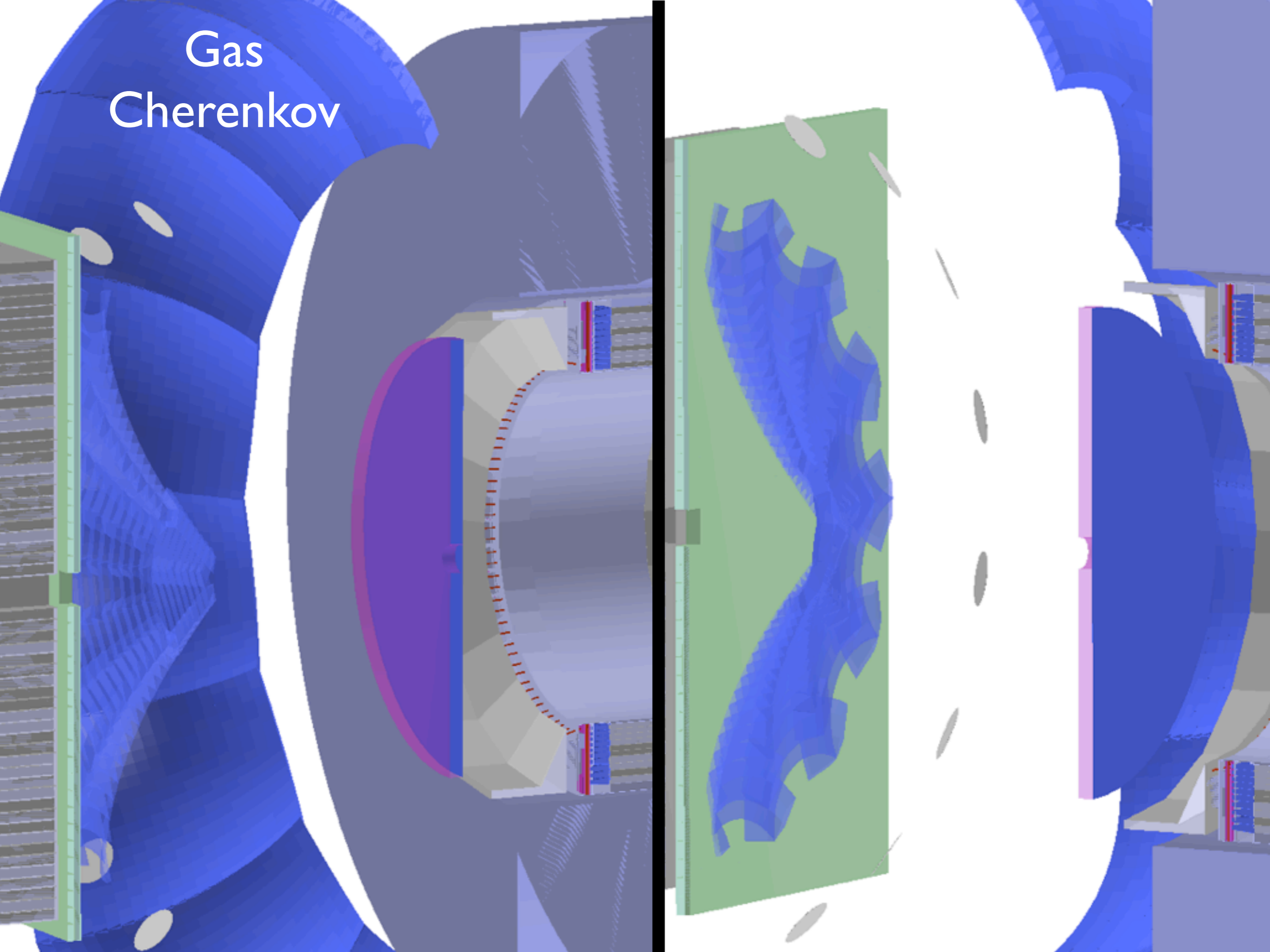
Baseline GlueX





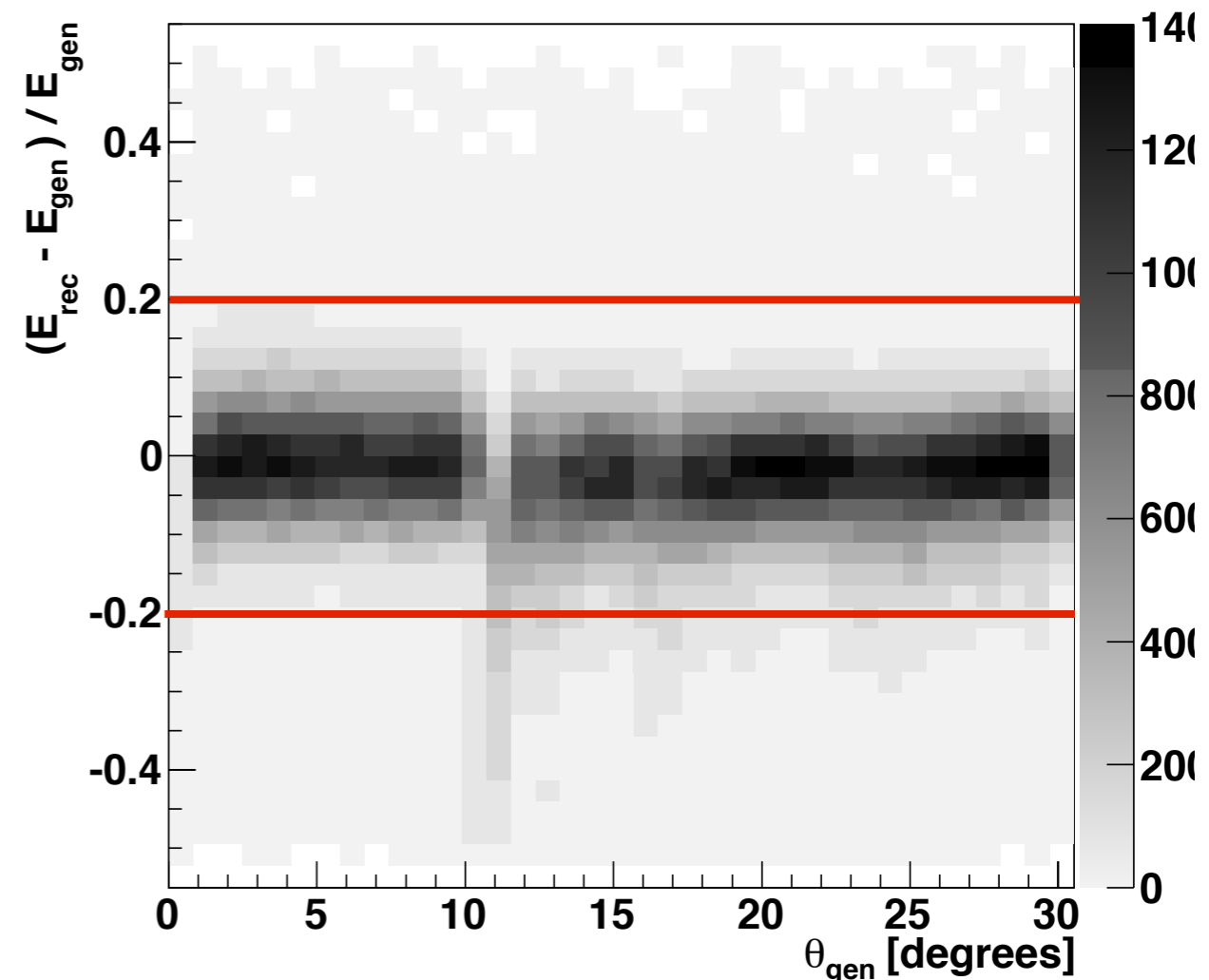
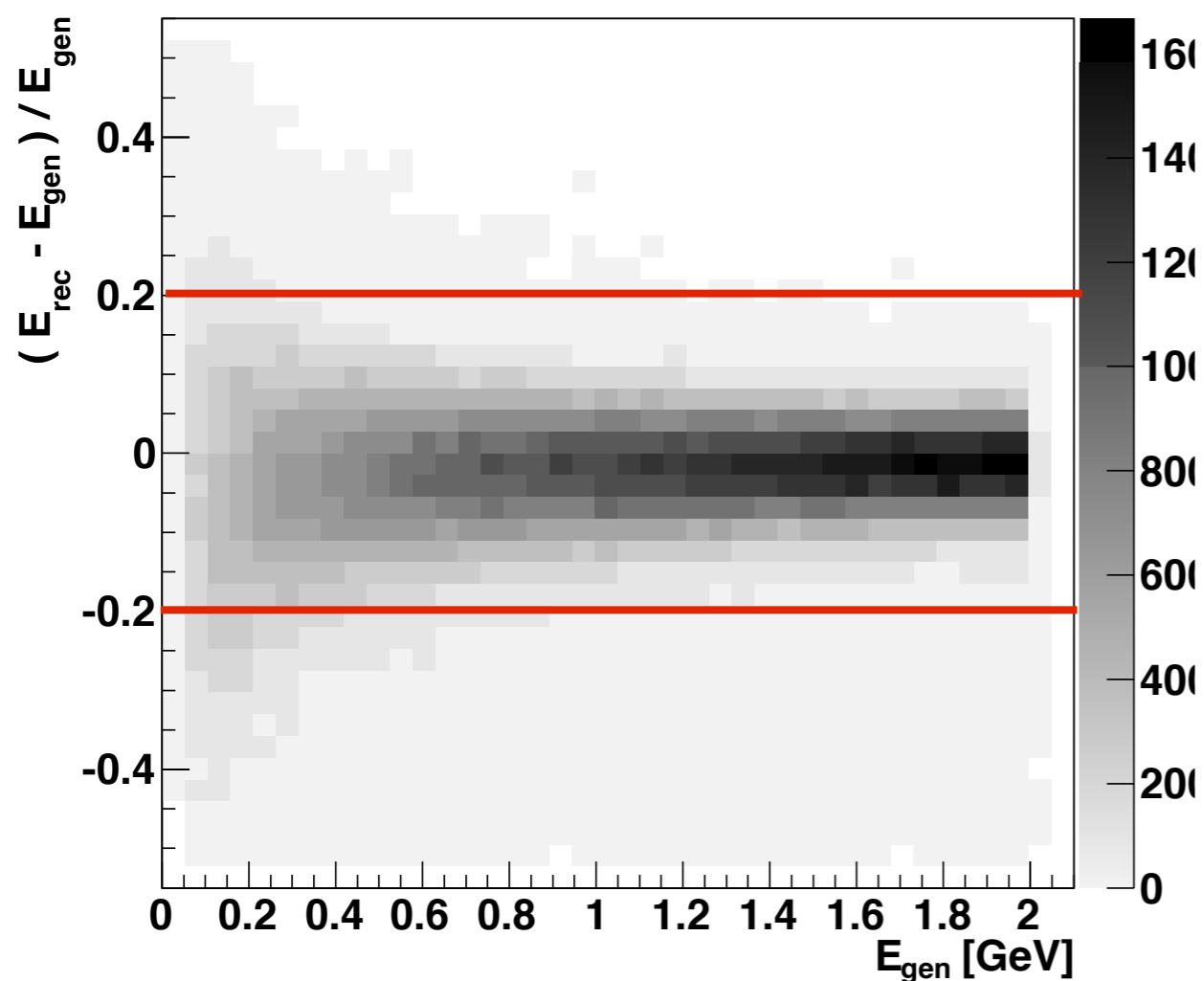
Helium FDC

Gas Cherenkov



Finding Photons: Energy

For now require reconstructed energy be within 20% of generated energy.
(We will make an energy-dependent cut later.)



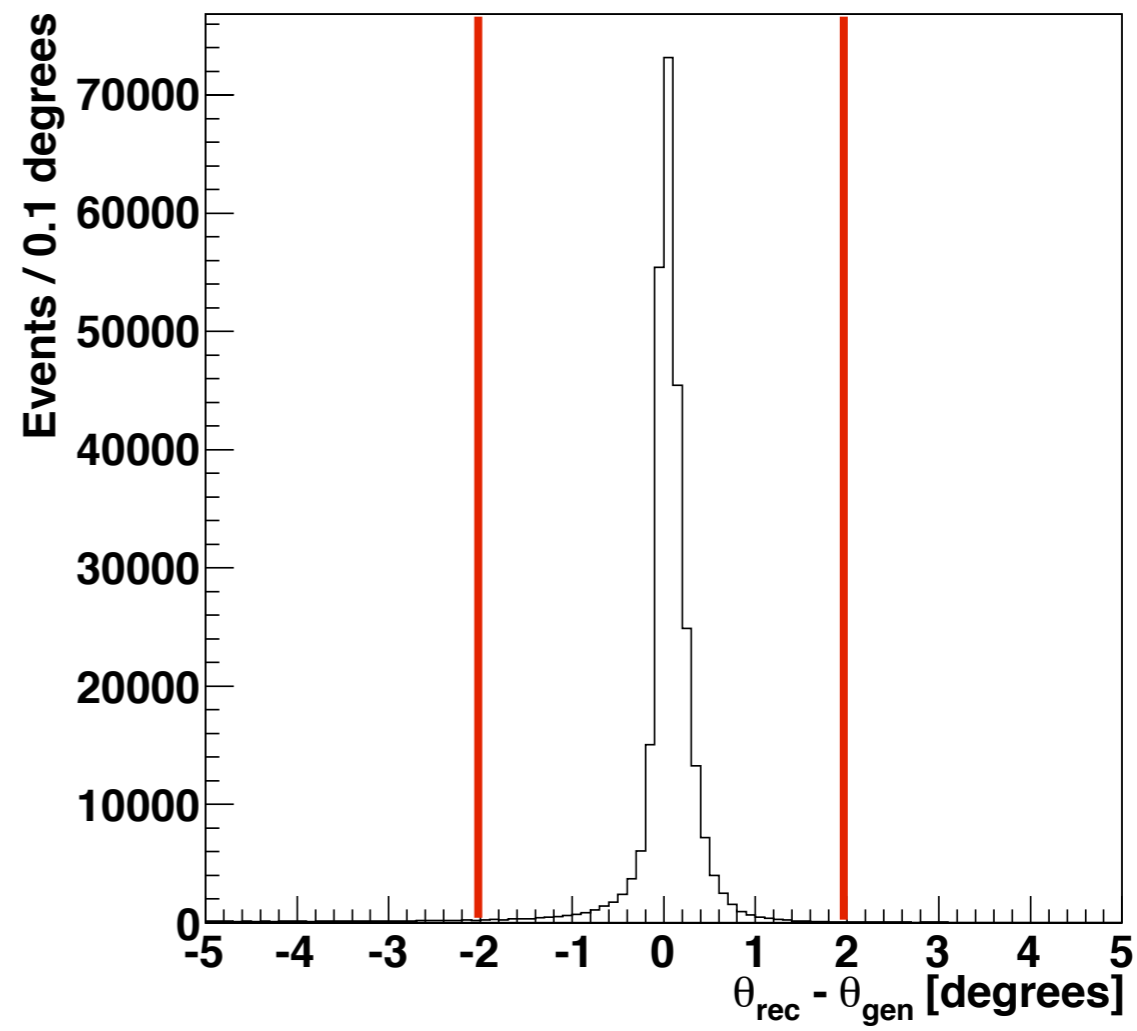
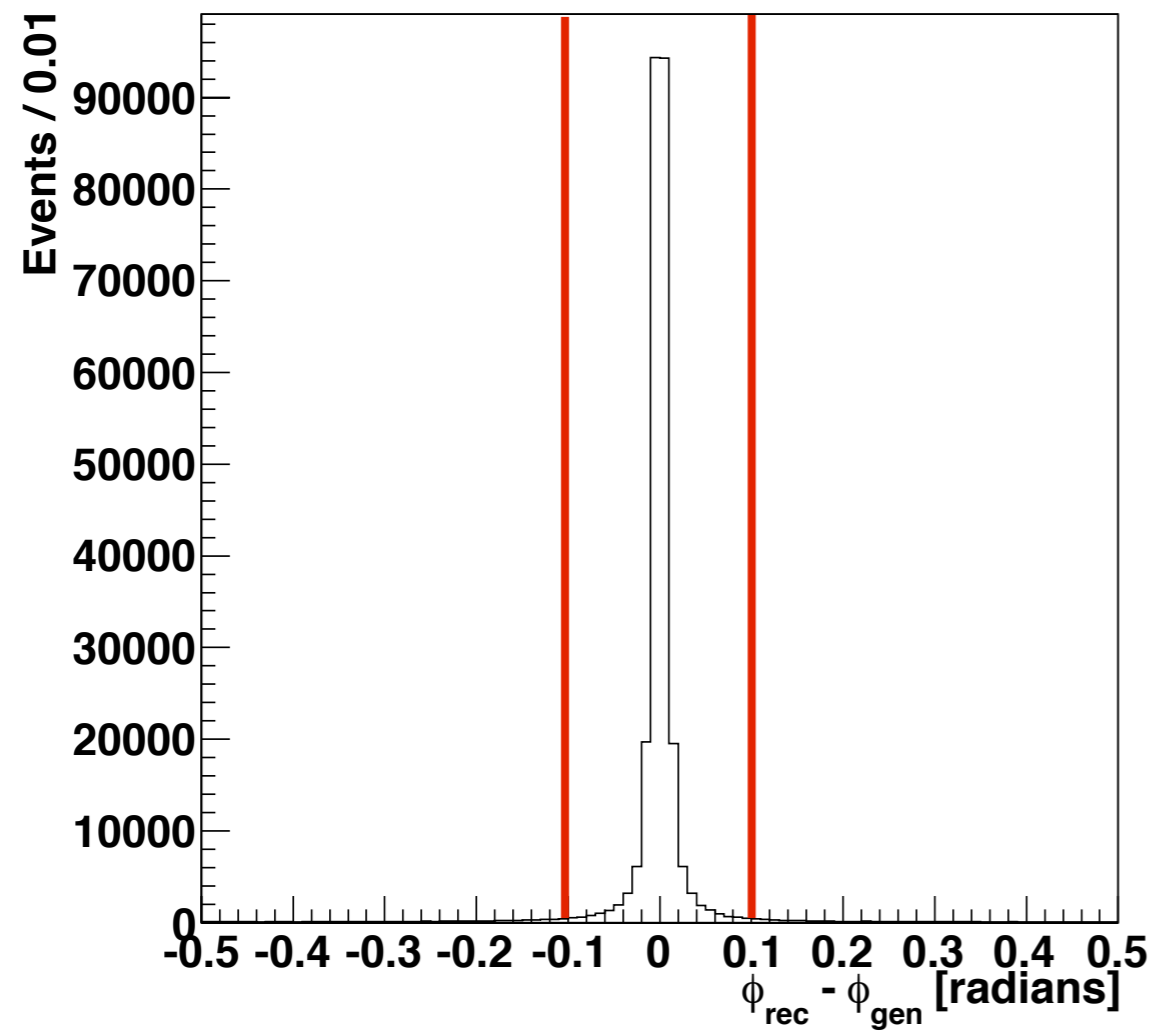
Default Geometry



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Finding Photons: Angles



Default Geometry

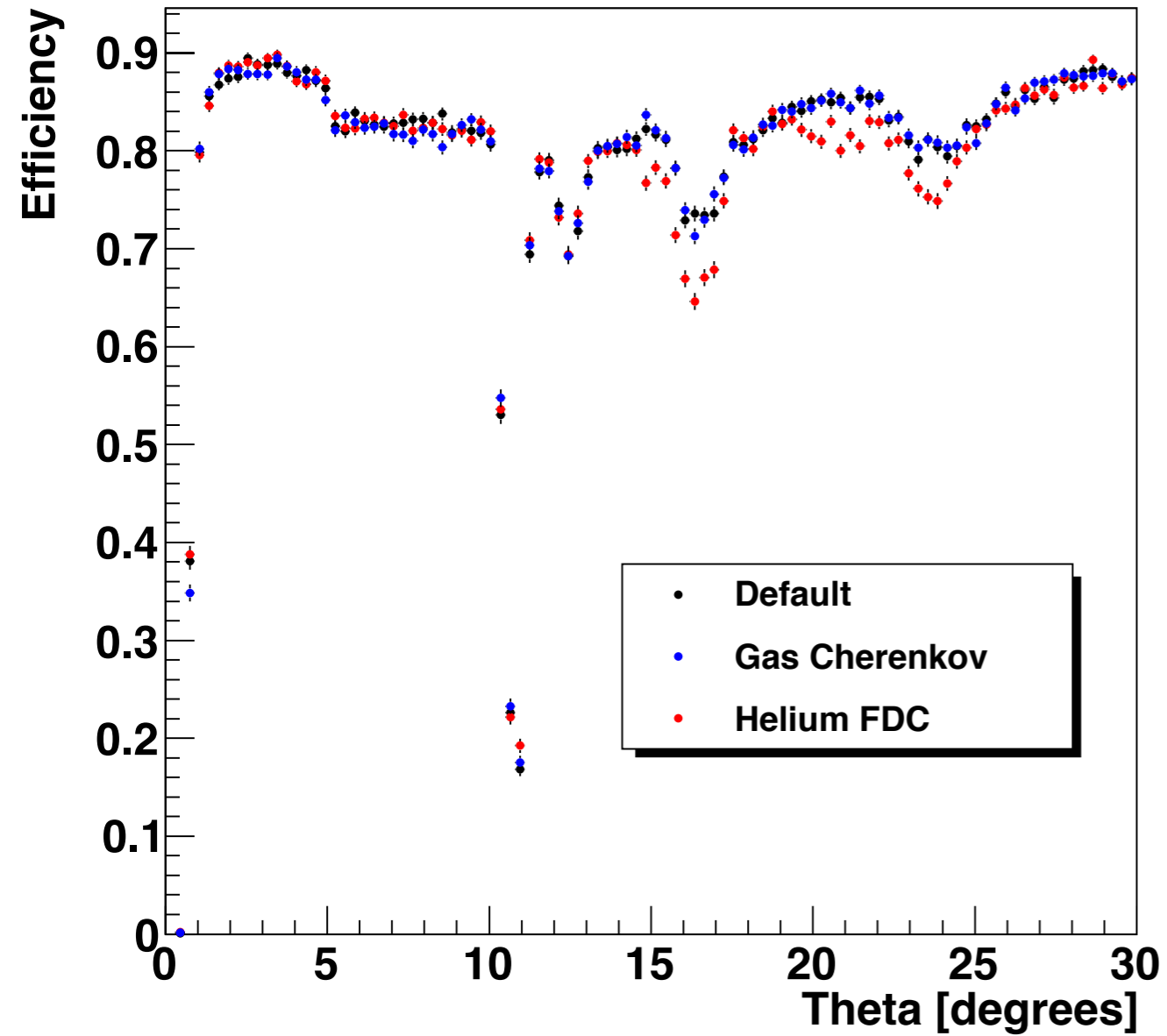


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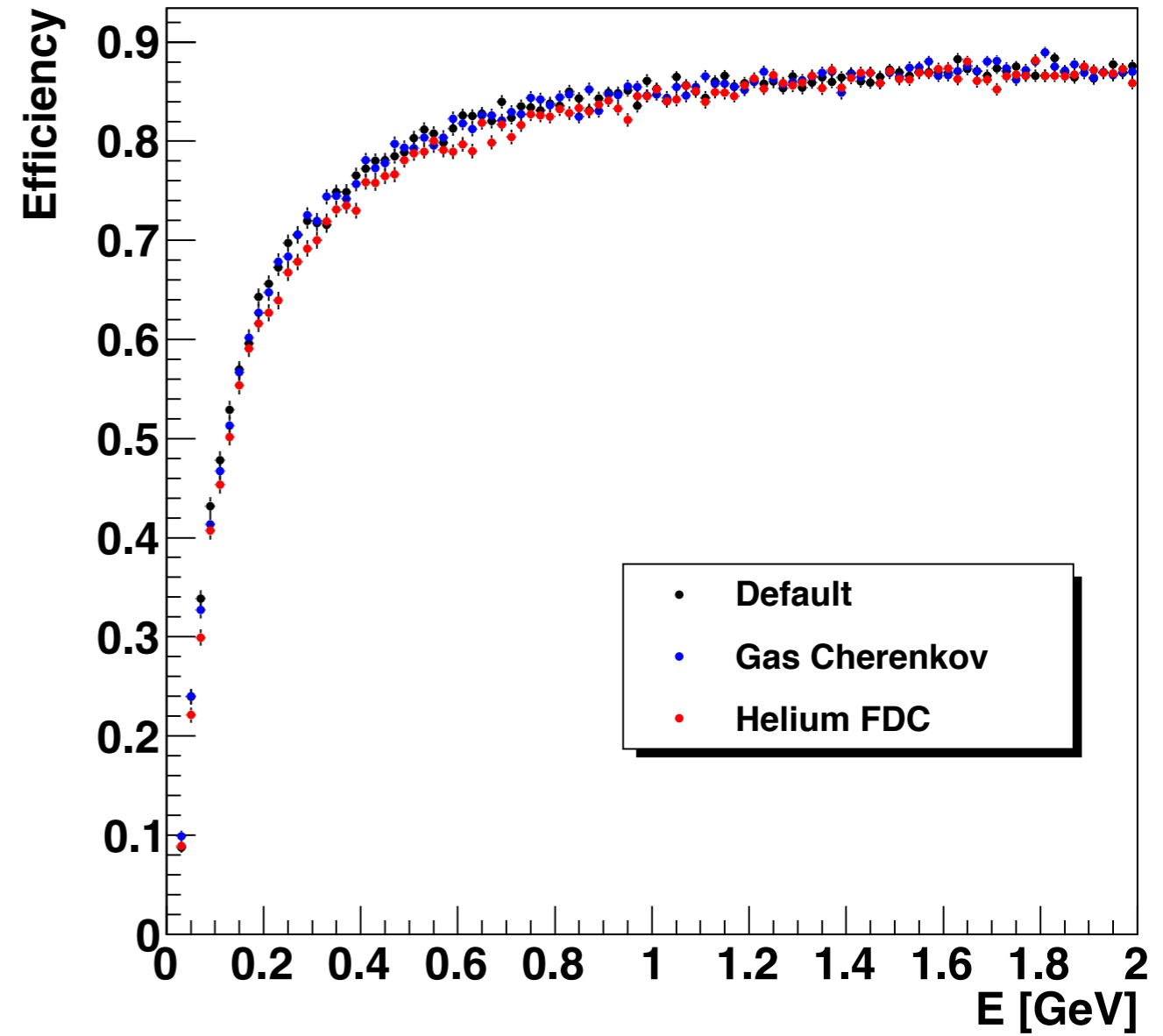
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Efficiencies

Integrated over $0 \text{ GeV} < E < 2 \text{ GeV}$



Integrated over $0^\circ < \theta < 30^\circ$



Conclusions

- First look at how PID material affects photon efficiency
 - Gas Cherenkov: little/no effect -- double check materials
 - Helium FDC: efficiency reduction (5%-10%) in 15°-25° region
- Need XML geometry specs for RICH detectors