SoLID/PVDIS 6.6 GeV

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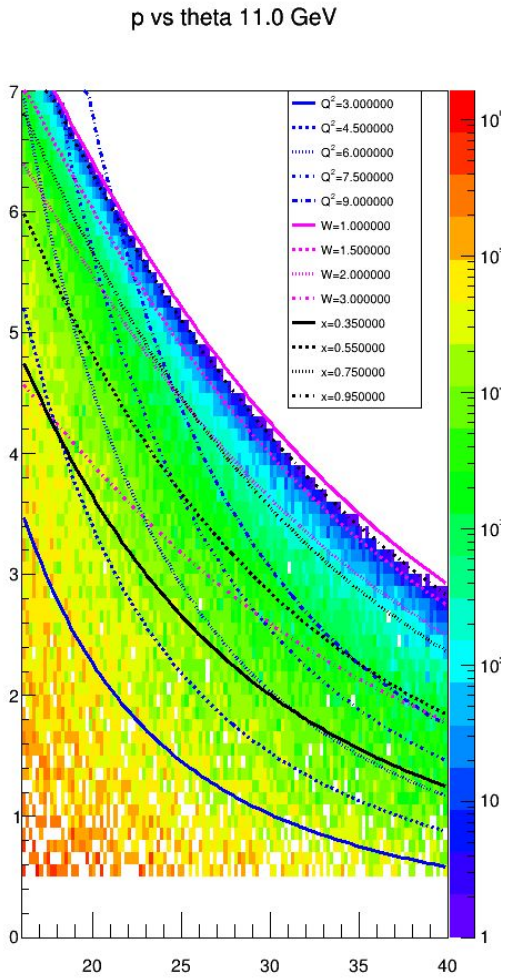
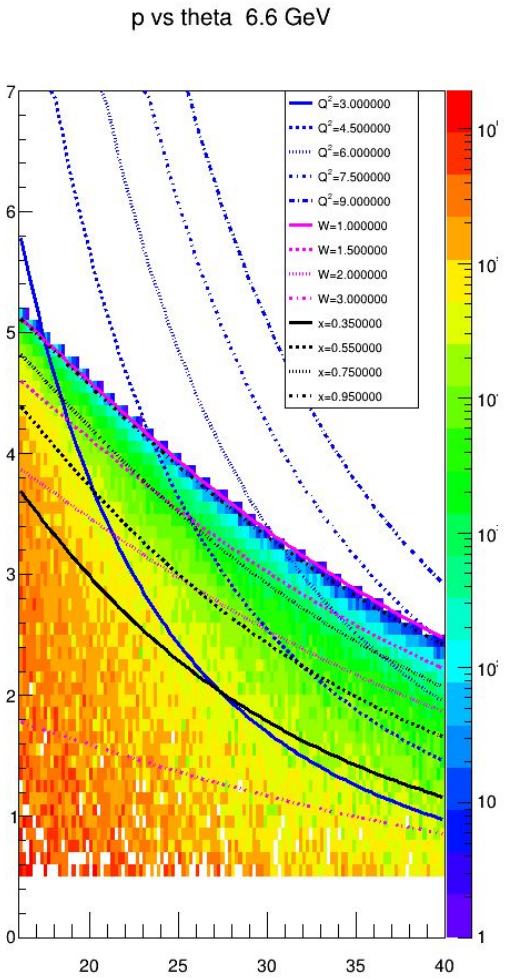
14 Nov 2017 Simulation Meeting (updated)

Kinematics — 11 and 6.6 GeV

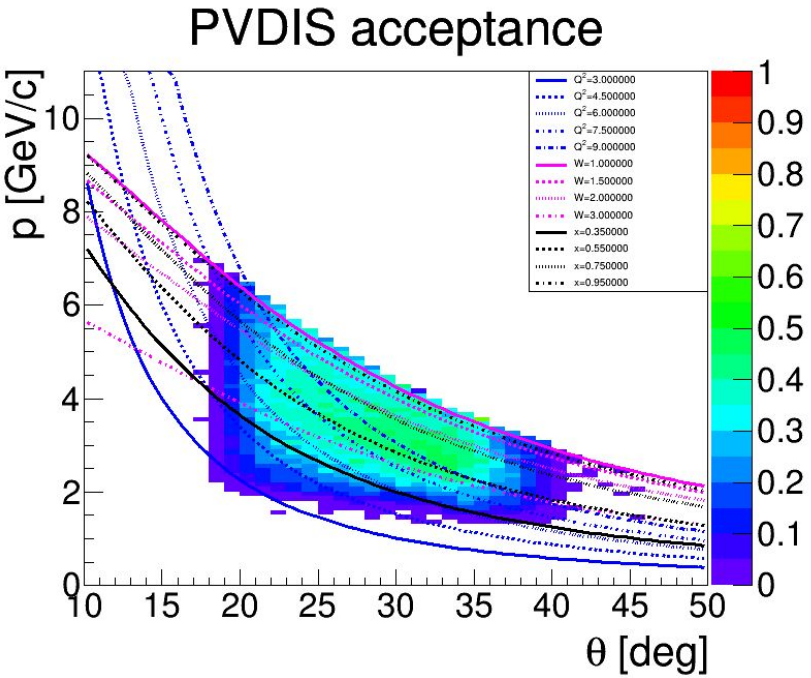
DIS generator, all primaries p > 0.5 GeV
(cf. Proposal Fig. 3.1)

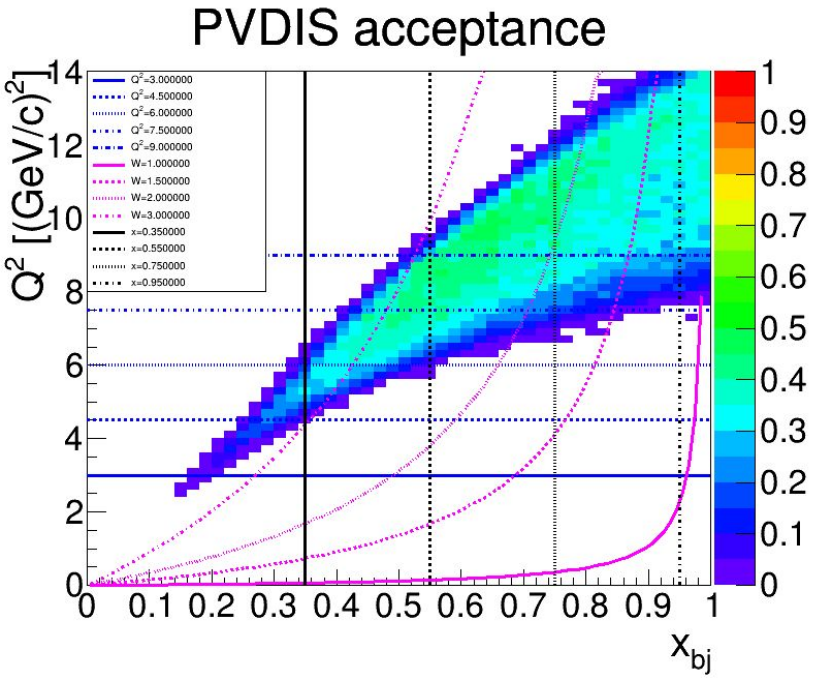




Acceptance — 11 GeV

Geometric acceptance only (requires passage through GEM, LGC, and EC flux detectors)

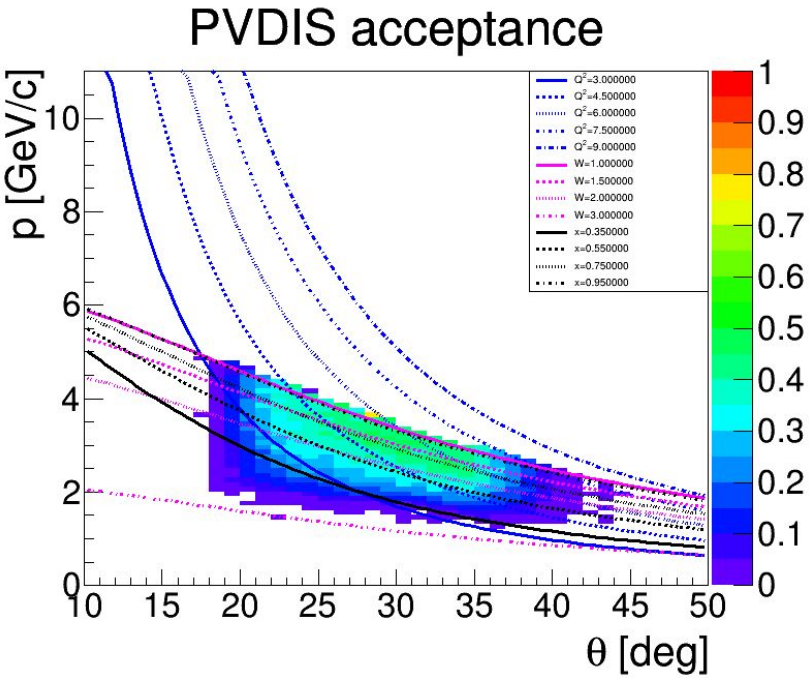


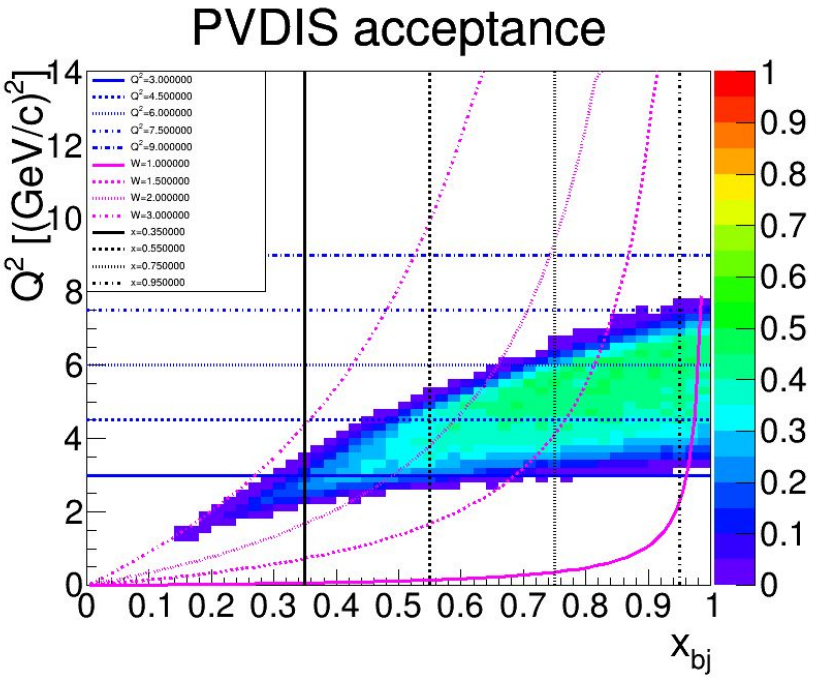


~40–50% for W > 2 GeV, X > 0.55, Q^2 > 6 GeV

Acceptance — 6.6 GeV

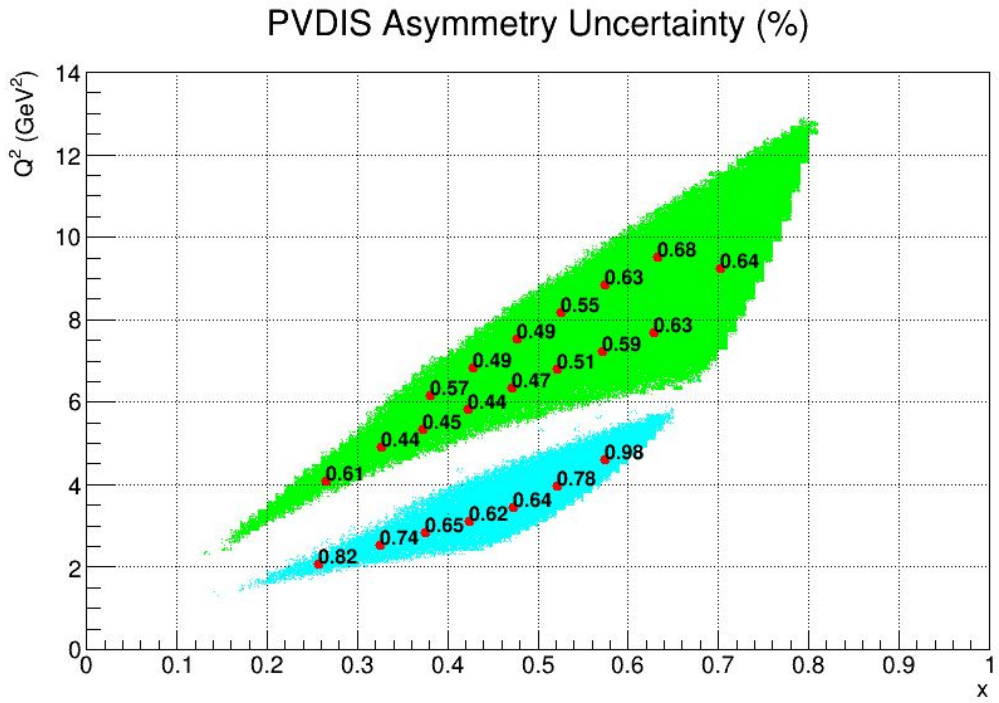
Geometric acceptance only (requires passage through GEM, LGC, and EC flux detectors)





~30% for W > 2 GeV, X > 0.45, Q^2 > 3.5 GeV

PVDIS asymmetry uncertainty (from Directors Review response)

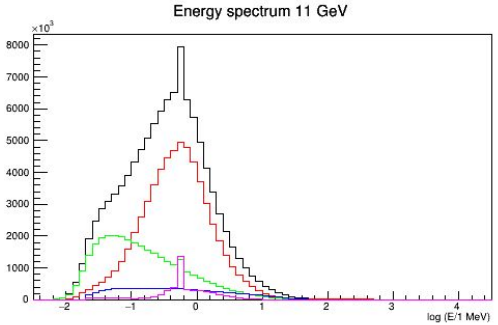


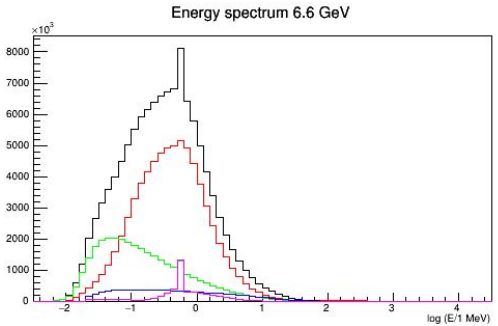
Green: 11 GeV
Cyan: 6.6 GeV

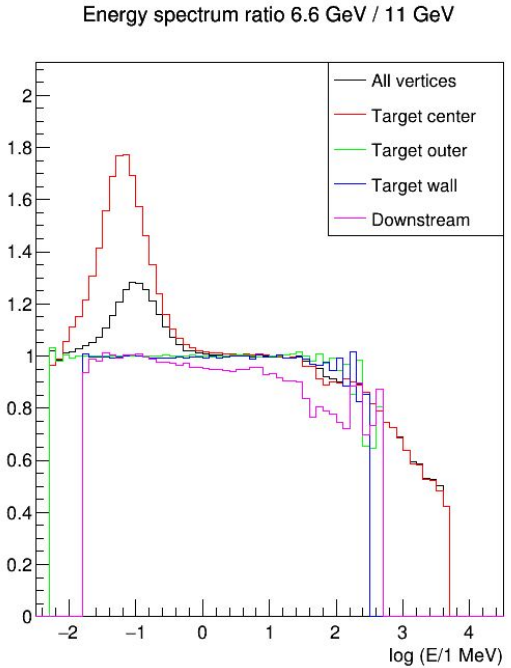
W > 2 GeV

Photon background energy spectra

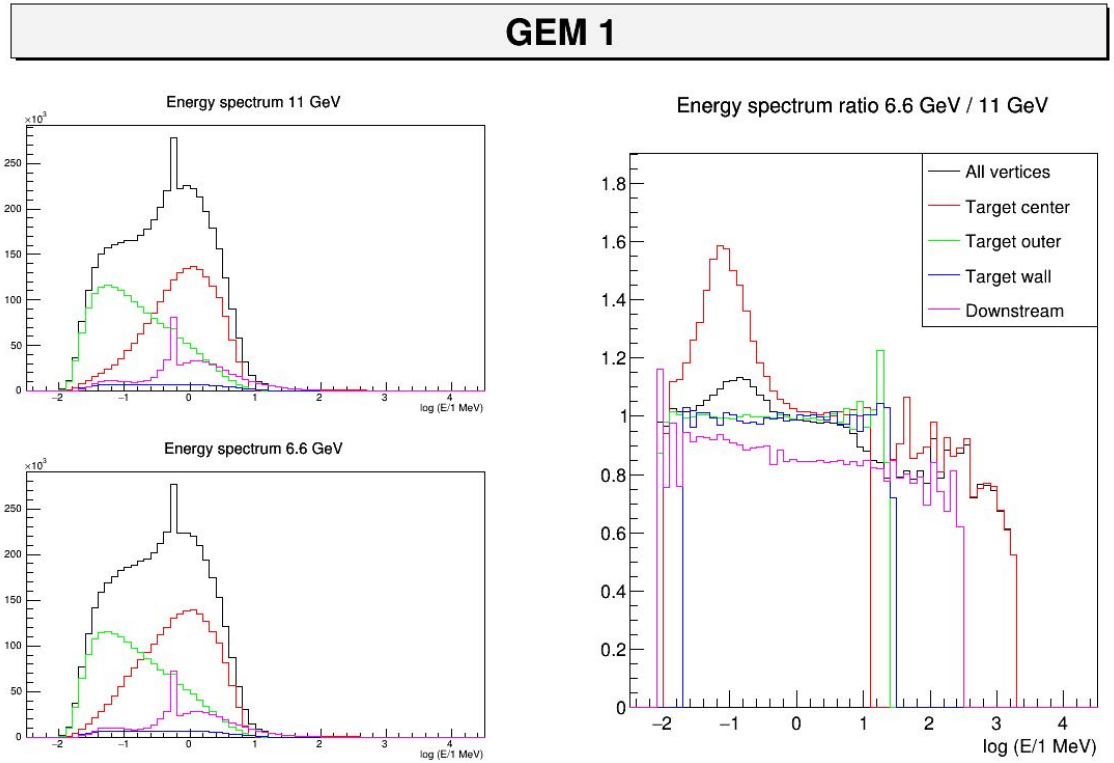
Before baffle





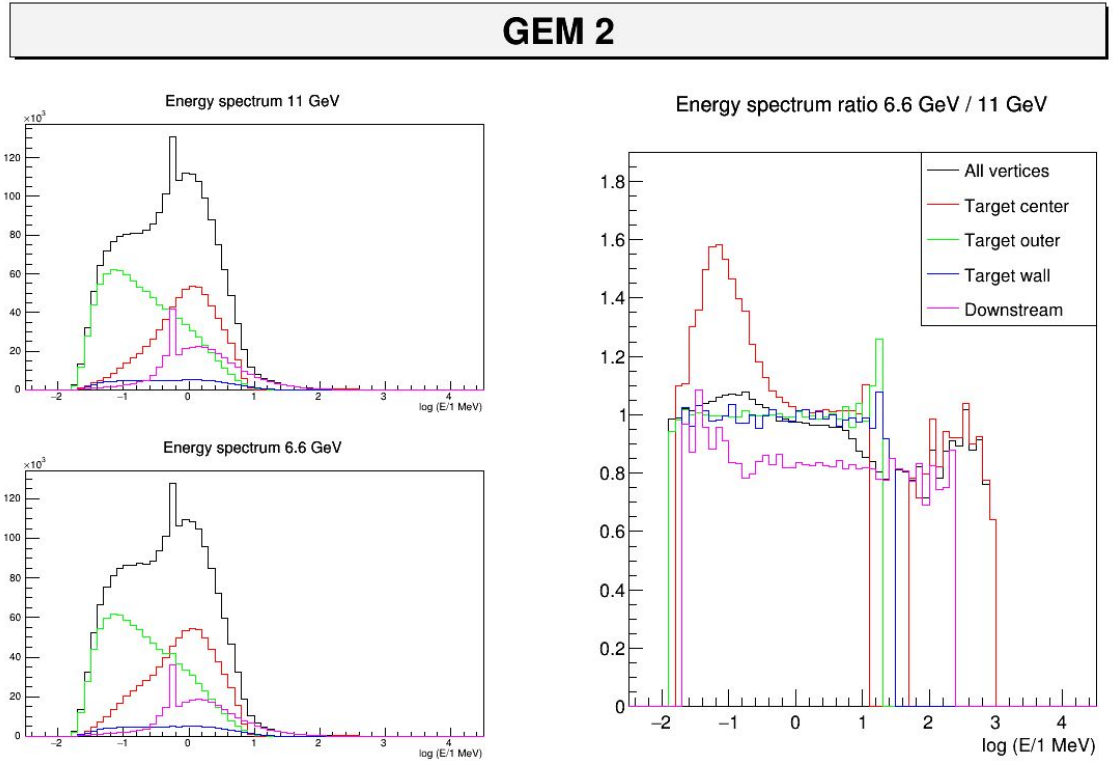


Photon background energy spectra



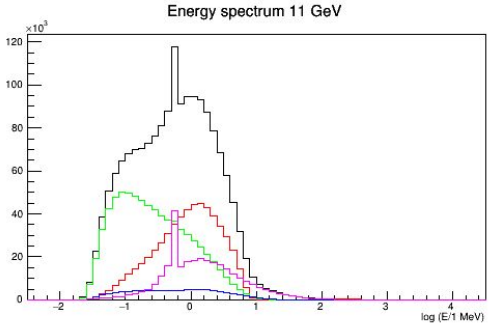
Updated since meeting: added ratio plot

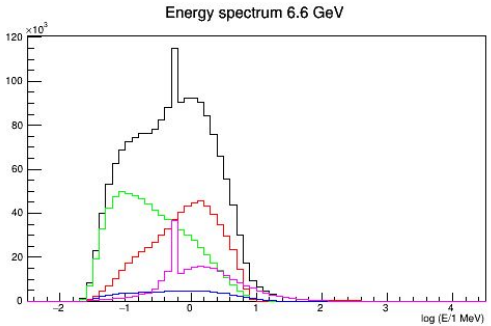
Photon background energy spectra

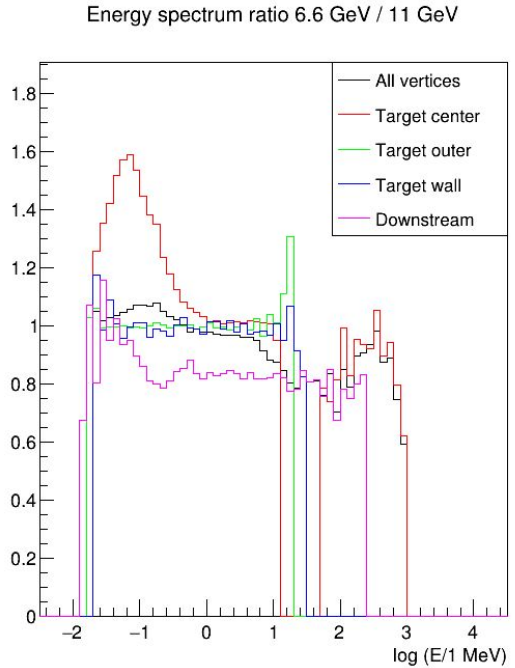


Photon background energy spectra

GEM 4

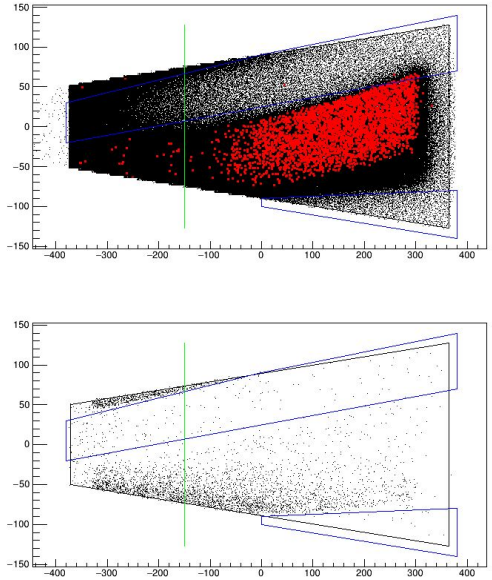




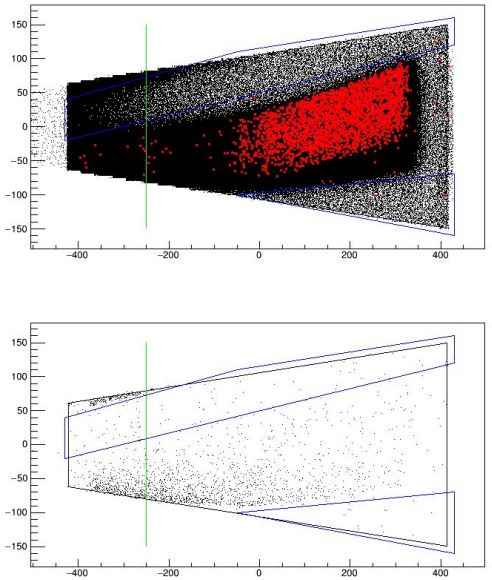


Occupancies: Divided strips and dead HV regions

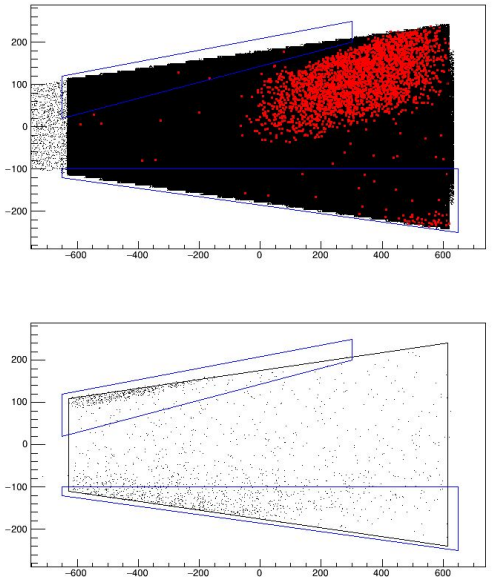
GEM 1



GEM 2



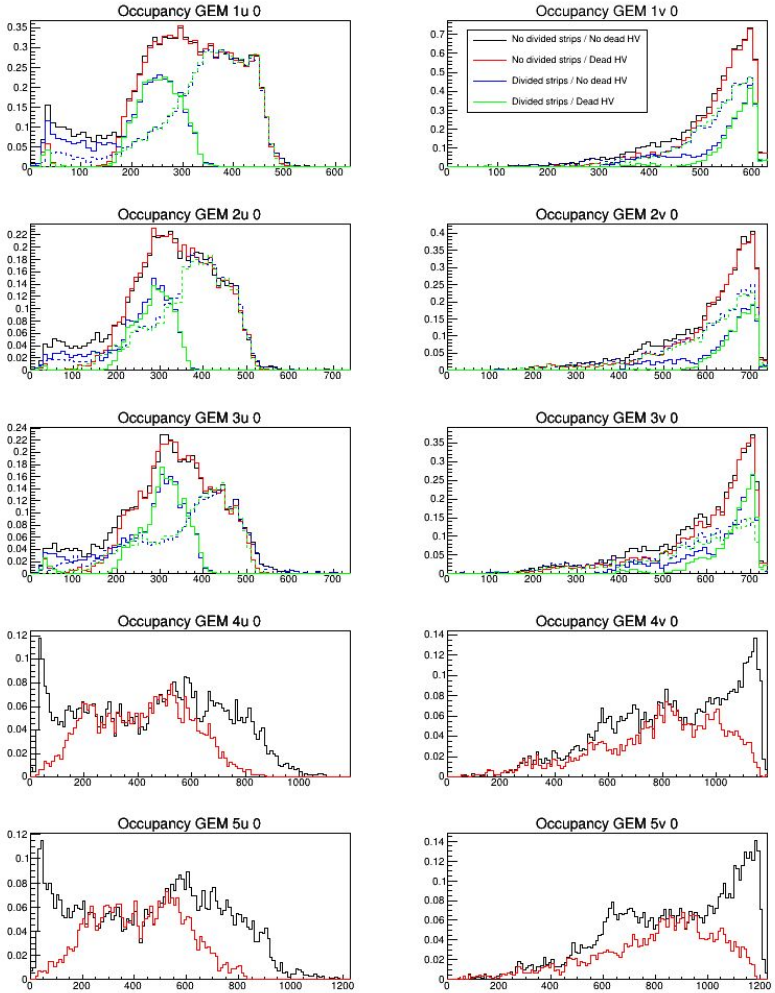
GEM 4



Similar to 11 GeV: DIS (W > 2 GeV, X > 0.45, Q^2 > 3.5 GeV) outside dead regions, BG in dead regions for downstream GEMs only, division segments for upstream GEMs look reasonable

Occupancies

Occupancies look similar to 11 GeV, but decreased by 0–20%. Divided strips and dead regions bring high occupancies down to manageable levels.

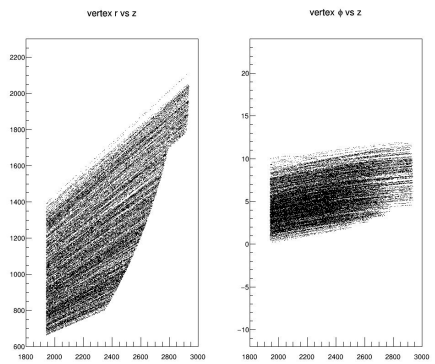


LGC background reduction

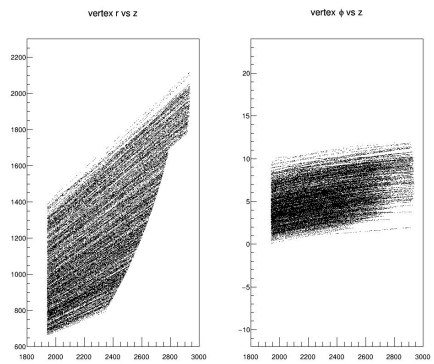
DIS: As with 11 GeV, ~10% loss with cones removed; little loss with blinders added.
Need Hall D π^0 data for background results

	Rate	**Optical photons**
Cones, no blinders (standard)	4932.37	113131
Cones, blinders	4727.5	112591
No cones, no blinders	4451.33	109461
No cones, blinders	4442.44	109807

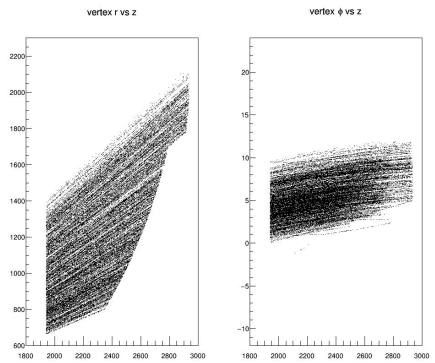
Cones, no blinders, 6.6 GeV



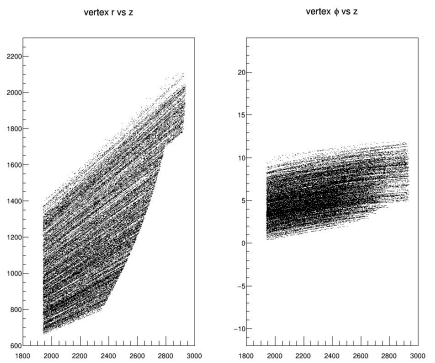
Cones, blinders, 6.6 GeV



No cones, no blinders, 6.6 GeV



No cones, blinders, 6.6 GeV



Questions to address

- Trigger rate and Efficiency
  - Requires EC study
- Backgrounds in GEMs, LGC, EC
  - Are blinders and cone removal still effective?
  - Need Hall D π^0
- Reduce magnetic field?