SoLID Simulation - Future Baffles and Backgrounds

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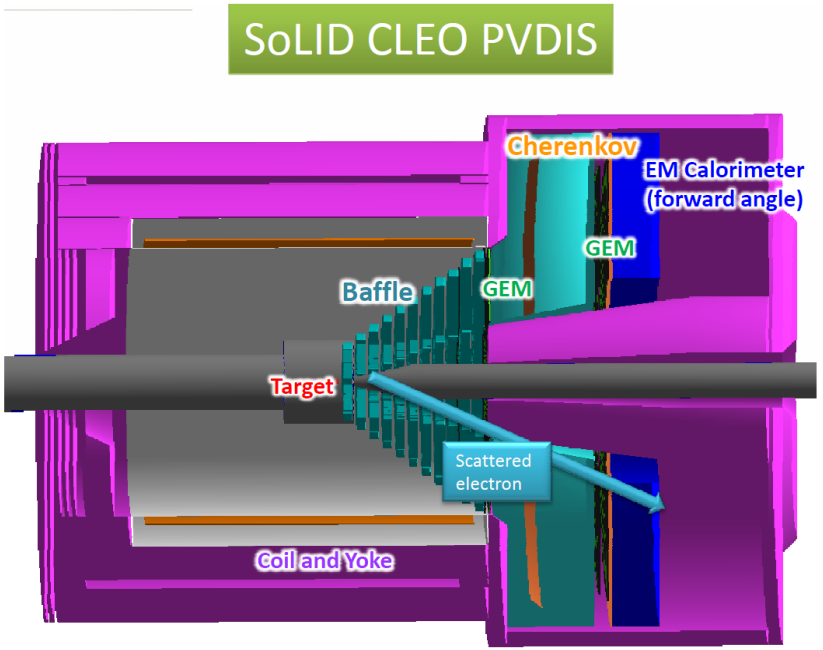
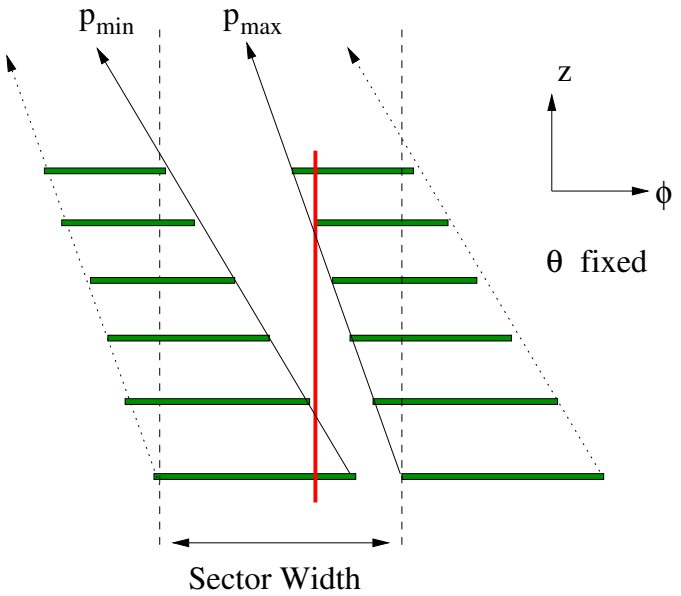
Outline

- Future Baffle Work
- Background Meetings

Baffles

- Original BaBar baffles still in use
- Optimization using analytic model insufficient for full background considerations
- Background driven optimization of broader phase space necessary



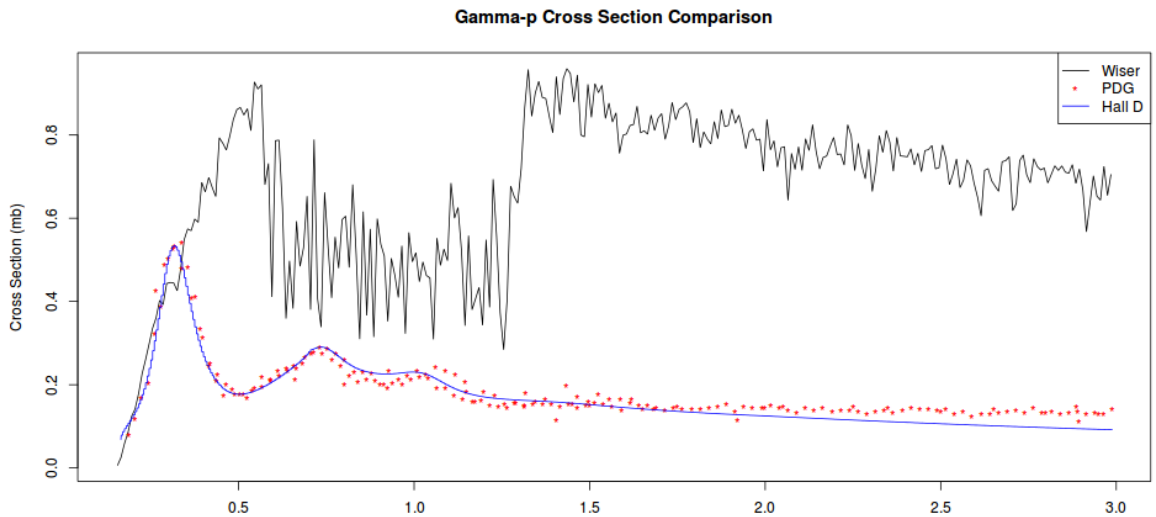


Baffles - Things to try

- Exploration of materials and combinations of materials necessary
- Available space may have changed with recent engineering review?
- Polynomial parameterization of curves with minimal parameters would be useful
  - Variations in edges is useful
  - Consider sloping edges and different materials on edges
- Optimizing FoM including backgrounds for combinations of GEMs, Cerenkov, ECal
- Need to address Director's Review concerns of "proving" our design is optimal and we have explored all reasonable options

Background Meetings

- Formed small working group for exploration of background issues and generator effectiveness
- Central issue is Wiser effectiveness for pion backgrounds in extrapolated phase space ($E_\gamma < 1$ GeV, $< 5^\circ$)
- Some new Generators/Methods:
  - Pythia
  - Hall D - SAID at low Q^2 + Pythia
  - Tiator/Wright EPA - Same spirit as Wiser but includes better approximations
  - Geant4 processes



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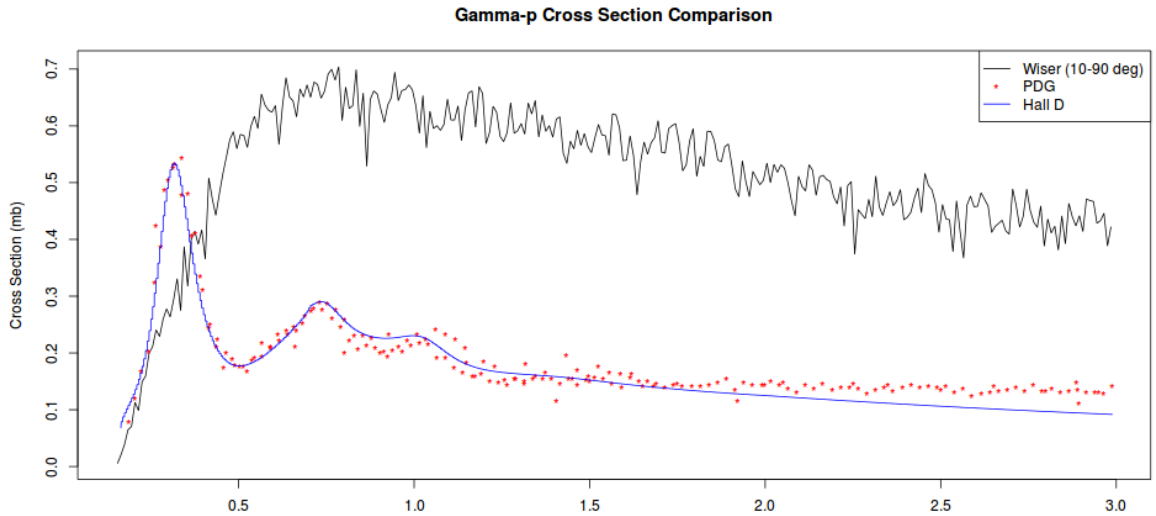
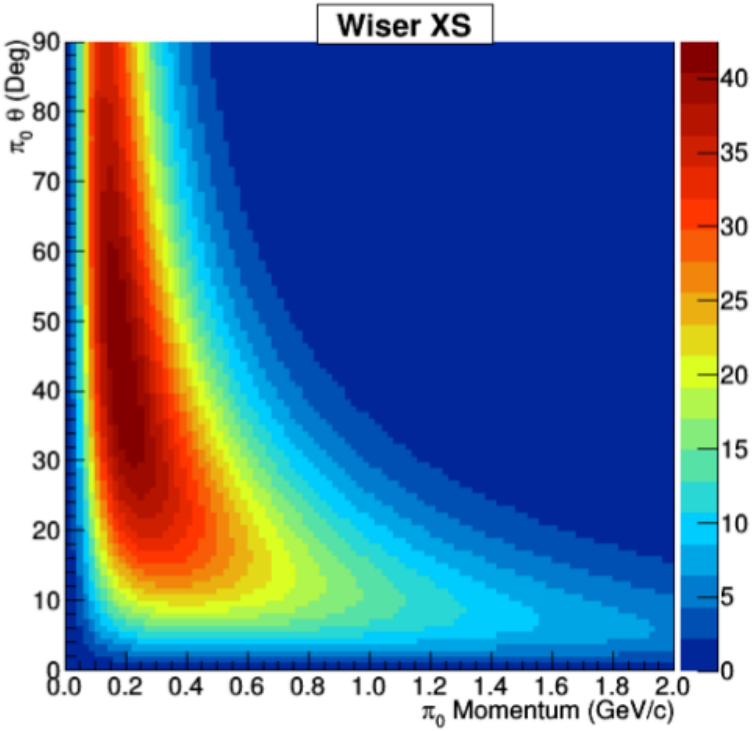
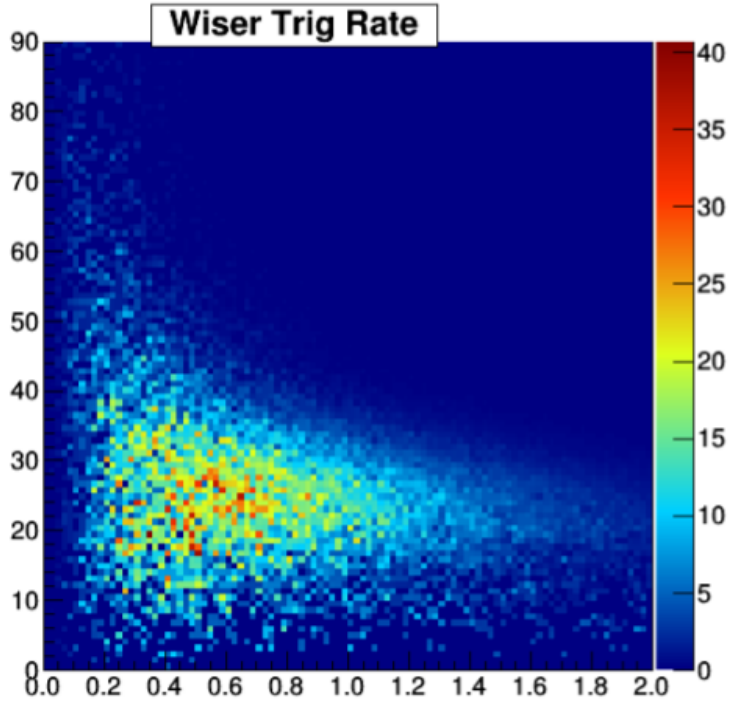


Wiser-standard

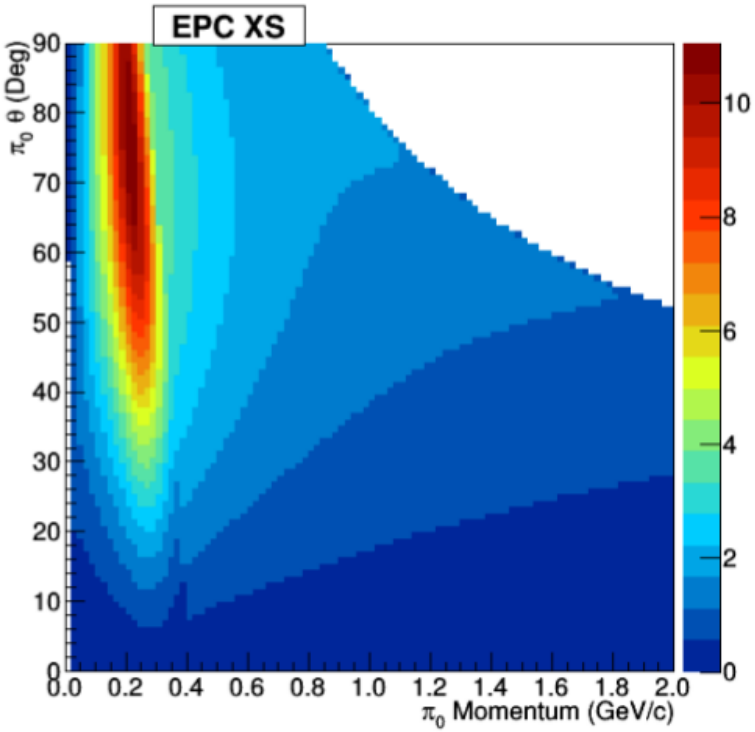


Wiser: ~ 80.0 ub

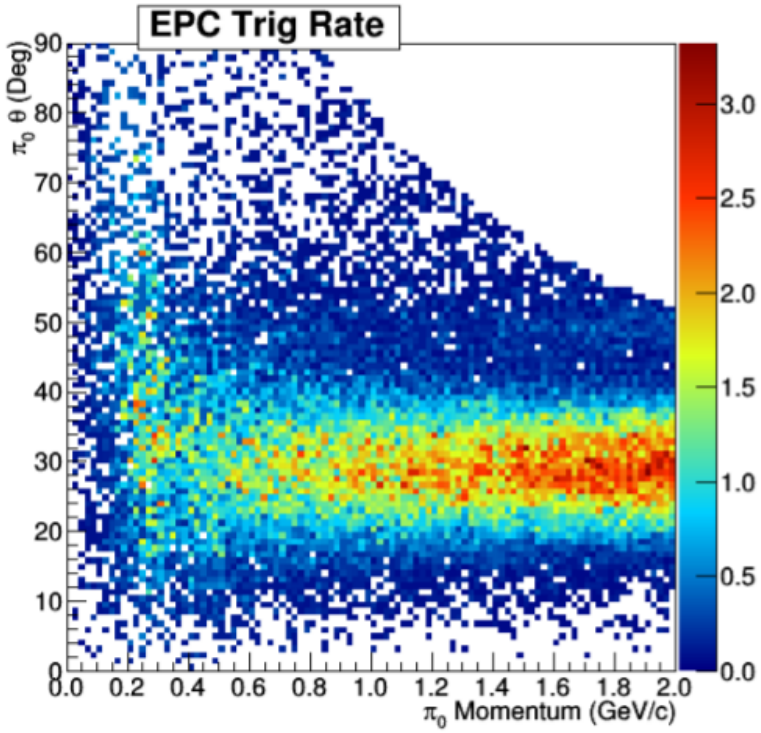


2x2 trigger:
Wiser: total rate: 24.6 MHz
rate/sec = 820 kHz
rate/PMT = 91 kHz

EPC



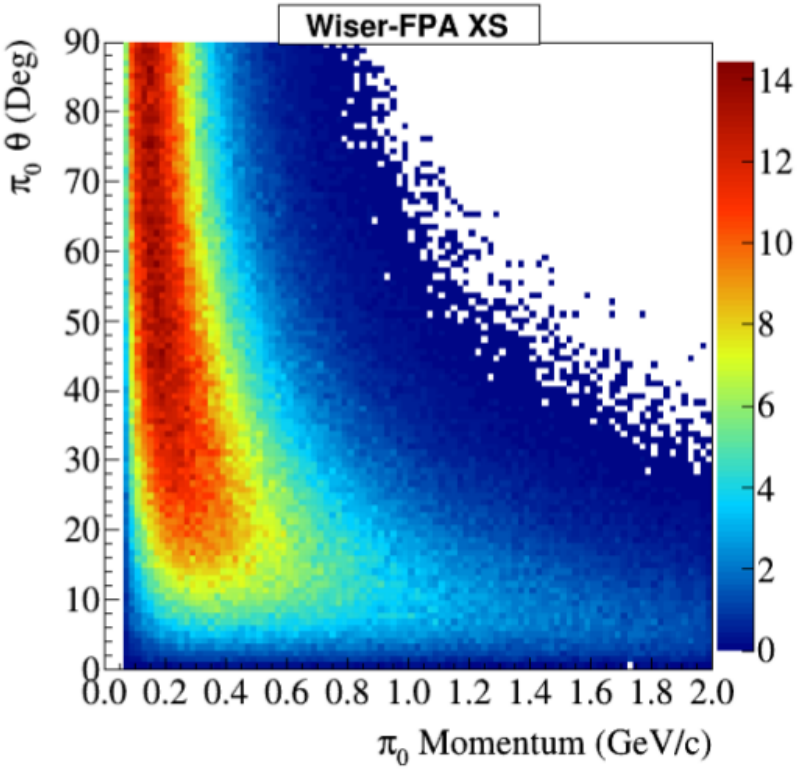
EPC: ~ 13.5 ub



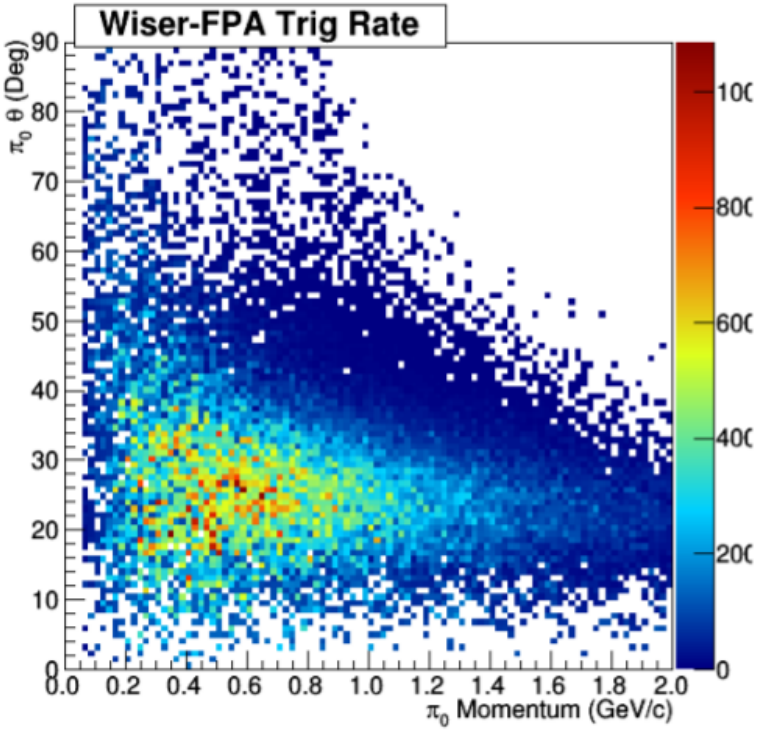
2x2 trigger:
EPC total rate: 3.7 MHz
rate/sec = 123 kHz
rate/PMT = 14 kHz

- Different pion parameterization, Tiator/Wright EPA

Wiser - FPA



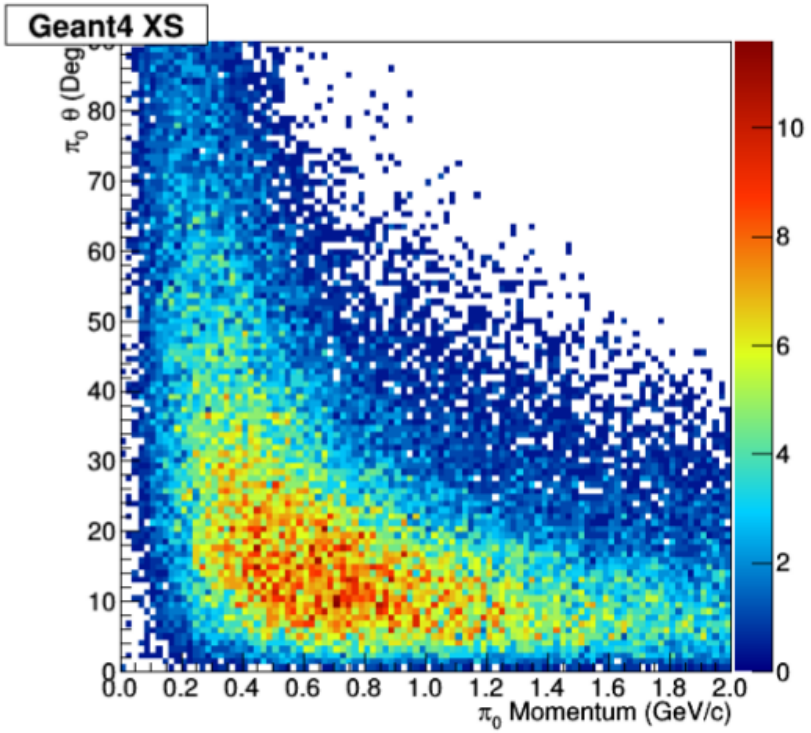
Wiser-FPA: ~ 23.1 ub



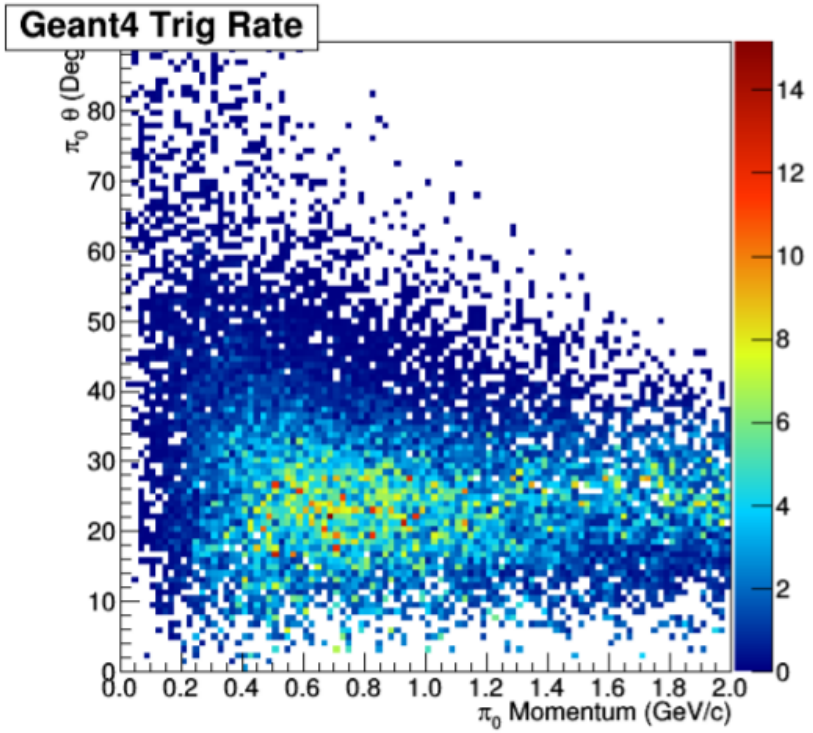
2x2 trigger:
Wiser-FPA total rate: 6.8 MHz
rate/sec = 226 kHz
rate/PMT = 25 kHz

- Wiser pion photoprod., Tiator/Wright EPA

Geant4 - XS



Geant4: ~ 13.75 ub



2x2 trigger:
g4 total rate: 8.0 MHz
rate/sec = 266 kHz
rate/PMT = 29.6 kHz

- Geant4 production

Background Generators - Future work

- Continue exploring different generators in broader phase spaces
- Pythia and Hall D generator comparison to Wiser will be interesting
- Personally - Trends seem to favor that Wiser is very high outside of extrapolated region and better photo $\rightarrow$ electroproduction methods are available