

EEEMCal: geometry update and gap study progress

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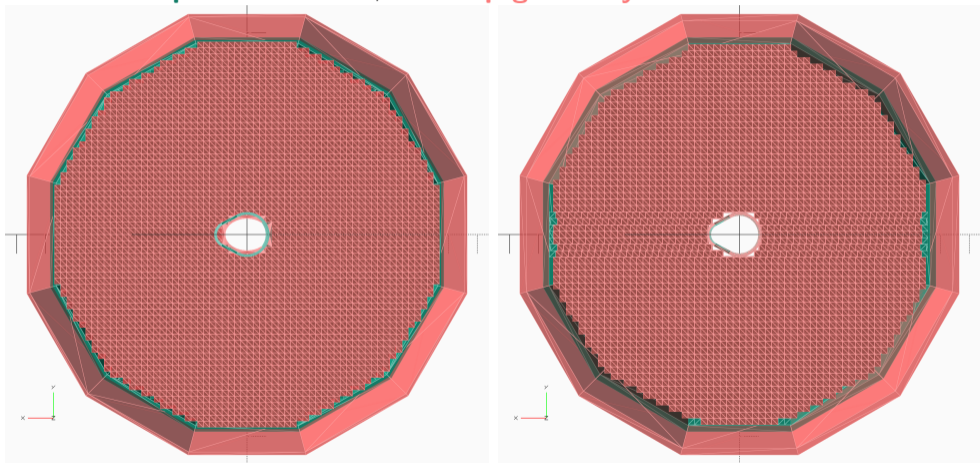
May 24, 2024

Geometry update

Continuing with <https://github.com/eic/epic/pull/704>.

Left: before – c6992d0, **Right:** current version – e0e6064;

CAD model provided to me, DD4hep geometry

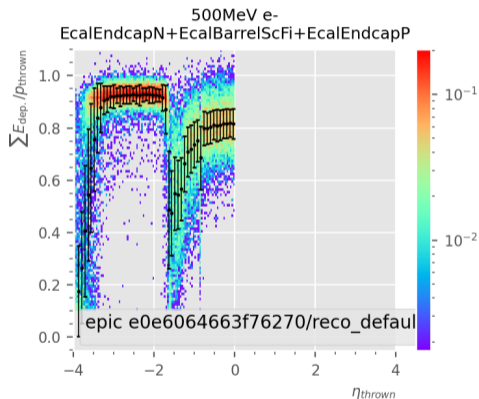
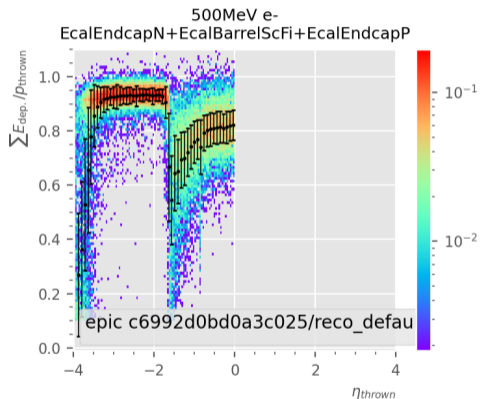


Changes are mostly ready. There is a small bug with 4 towers missing in the bottom.

500MeV

Continuing with <https://github.com/eic/epic/pull/704>.

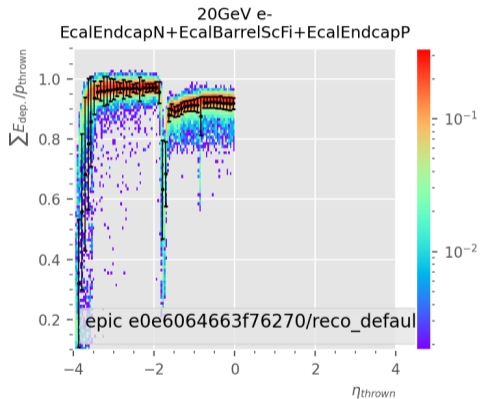
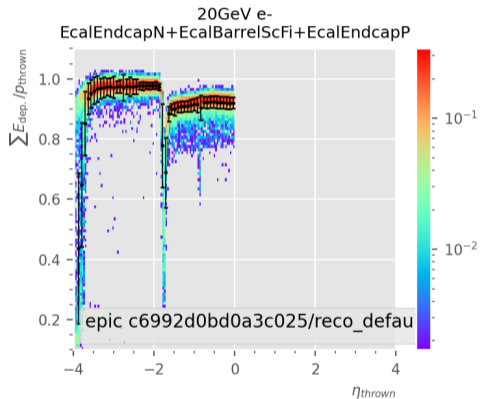
Left: before – c6992d0, **Right:** current version – e0e6064;



20GeV

Continuing with <https://github.com/eic/epic/pull/704>.

Left: before – c6992d0, **Right:** current version – e0e6064;



Gap

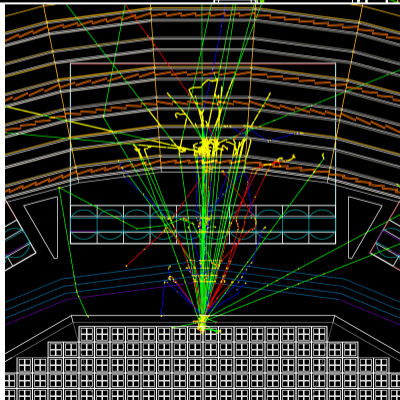
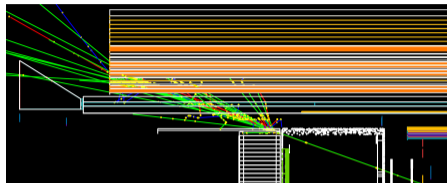
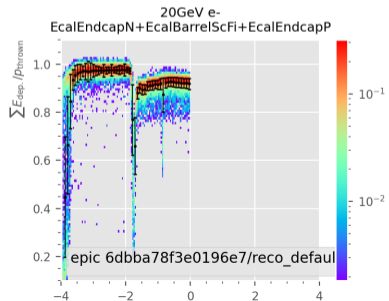
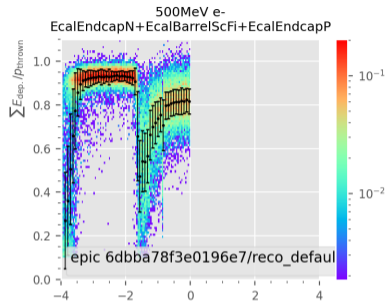
- ▶ BIC is shortened at the negative side by 1.5 cm in epic GitHub PR #729

Last time

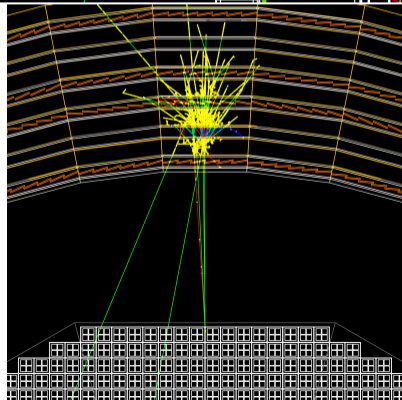
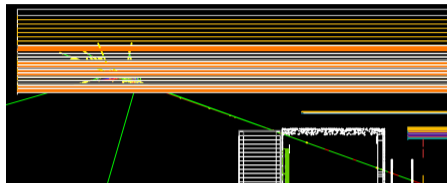
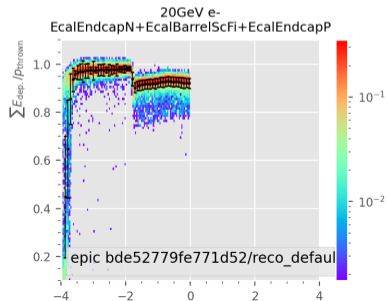
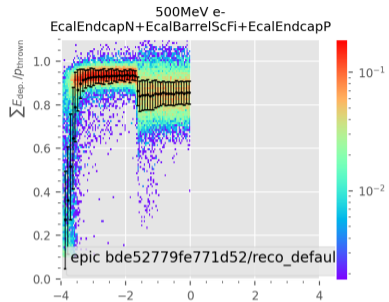
it was conjectured that it can be either:

1. radiation on outer support spreads the energy and signal drops below the 5 MeV threshold
I tested this, and that is not the problem
2. radiation on outer support produces rays with shallow polar angles

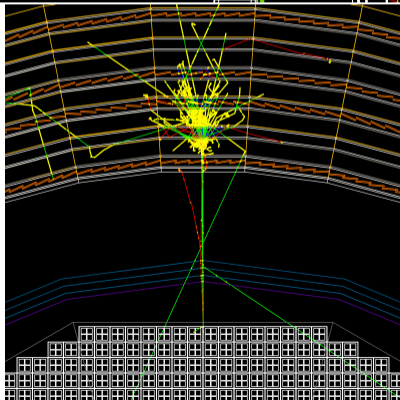
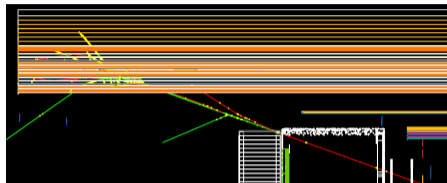
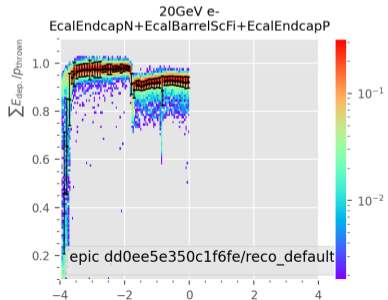
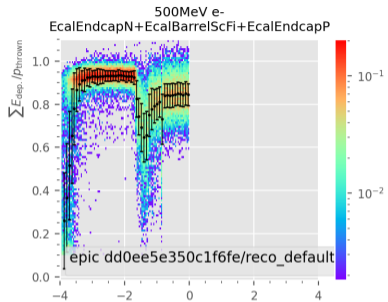
Baseline detector



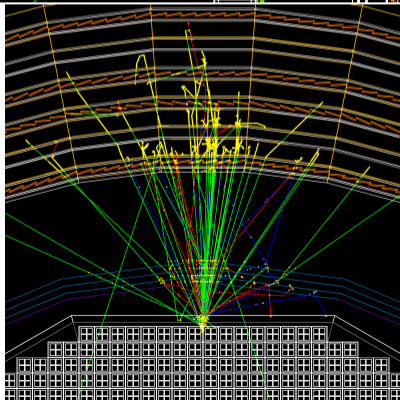
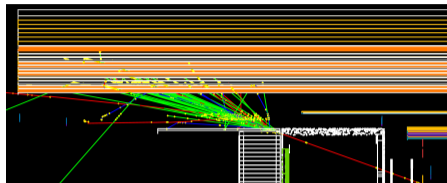
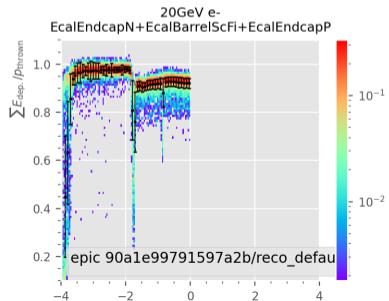
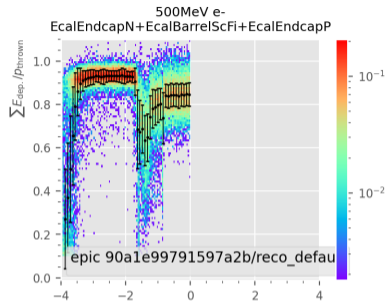
No dirc, extended barrel ecal, no supports



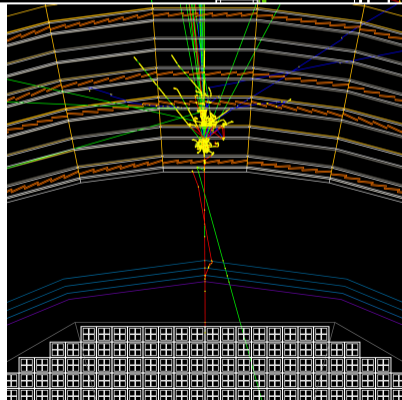
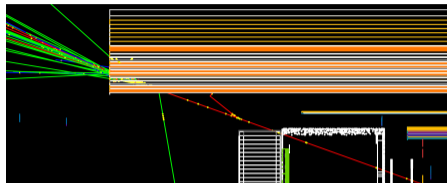
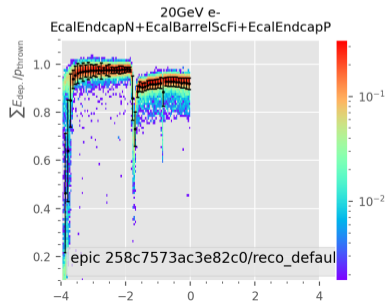
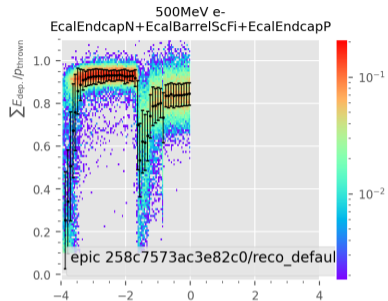
Add back services



Add back outer frame



Remove outer frame, shorten barrel ecal



Conclusion

- ▶ Inner opening in the new design seemingly doesn't decrease the acceptance by much
- ▶ Closing the gap requires both increasing BIC acceptance and reducing the support material (especially latter)