EEEMCal: inner support geometry and embedded background study

Dmitry Kalinkin

April 11, 2024

Geometry update

Slides from Carlos
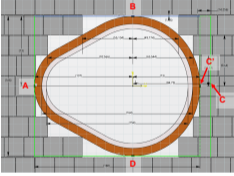
CAD drawing for the collar

Received CAD drawing for the collar from Carlos
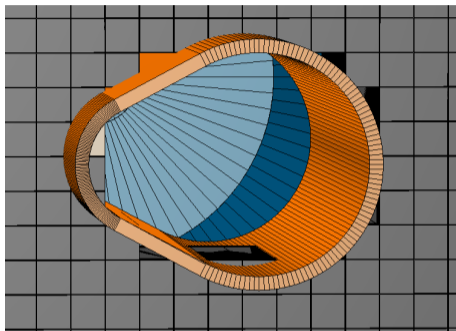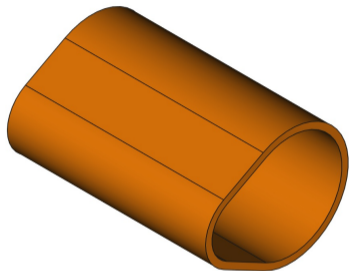
- ▶ Reverse-engineered into a DD4hep geometry
  https://github.com/eic/epic/pull/704
- ▶ Issue 1: Obvious overlaps with the cells
- ▶ Issue 2: Surrounding cells now float in the air (used to be full-copper). What is the new material in-between?

Next steps for DD4hep implementation

Left: current (solid shading), Center: new collar (wireframe), Right: new collar + shift cells up
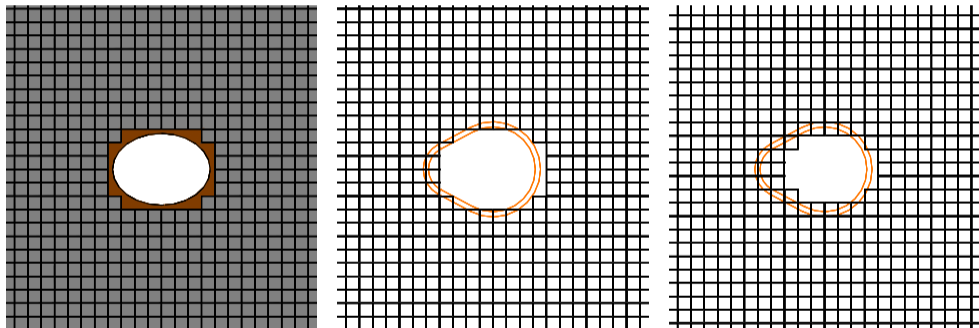
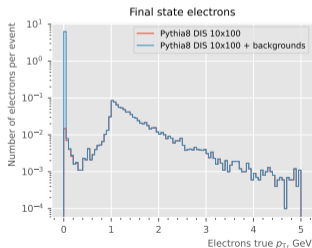▶ Just shifting cells up doesn't fit like on the slides
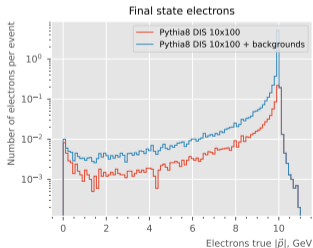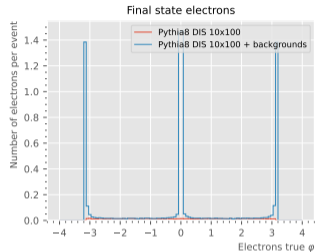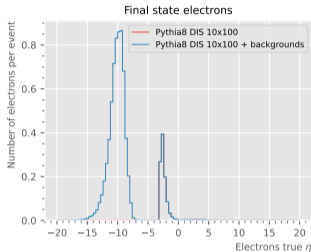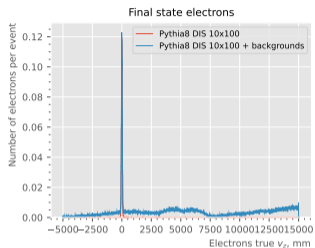
Background embedding

Quick reminder

Passing `--squashTime` option to the `signal_background_merger.py` fixes missing signal in the calorimeters.

With that, I'm continuing the study of my full event emebedding sample.

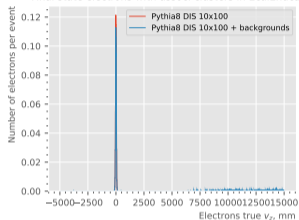# Truth electron distributions

This is based on MCParticles

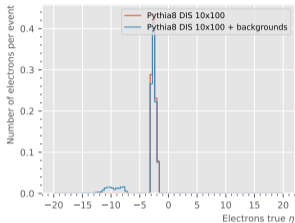Funky φ can't be due to the crossing angle (see slide 4 of <u>this</u>, also peaks of the same height)

Truth electron distributions: those with clusters

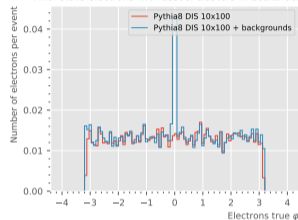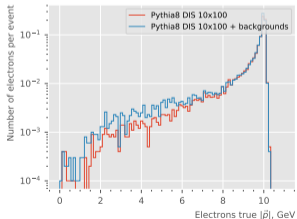This is based on MCParticles with associated clusters in EcalEndcapN

Truth electron distributions: those with clusters

This is based on MCParticles with associated clusters in EcalEndcapN, $E/p > 0.8$
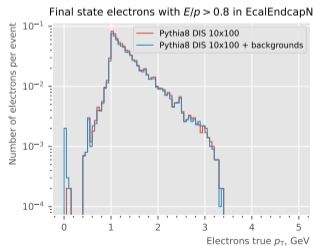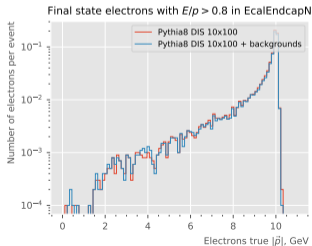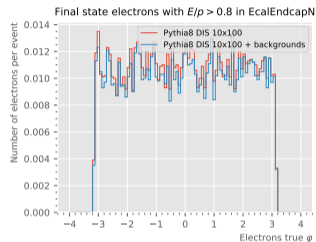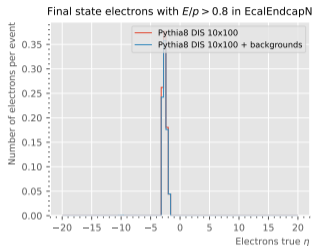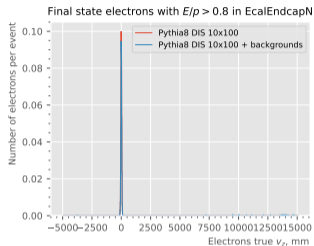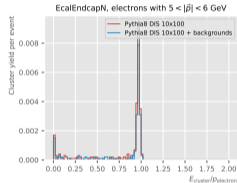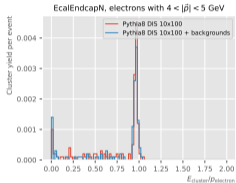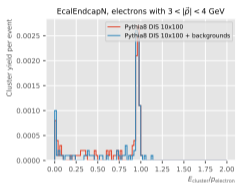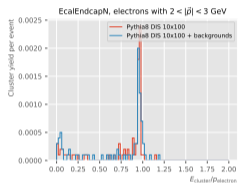
E/p distributions

This uses truth associations to match EcalEndcapN clusters to the electrons among MCParticles
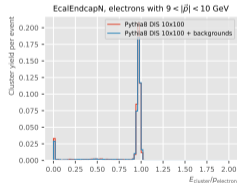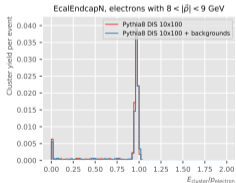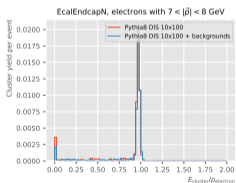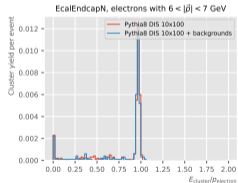
Effect on the resolution is small, would be hard to quantify without more statistics