First results on muon ID with MUSIC

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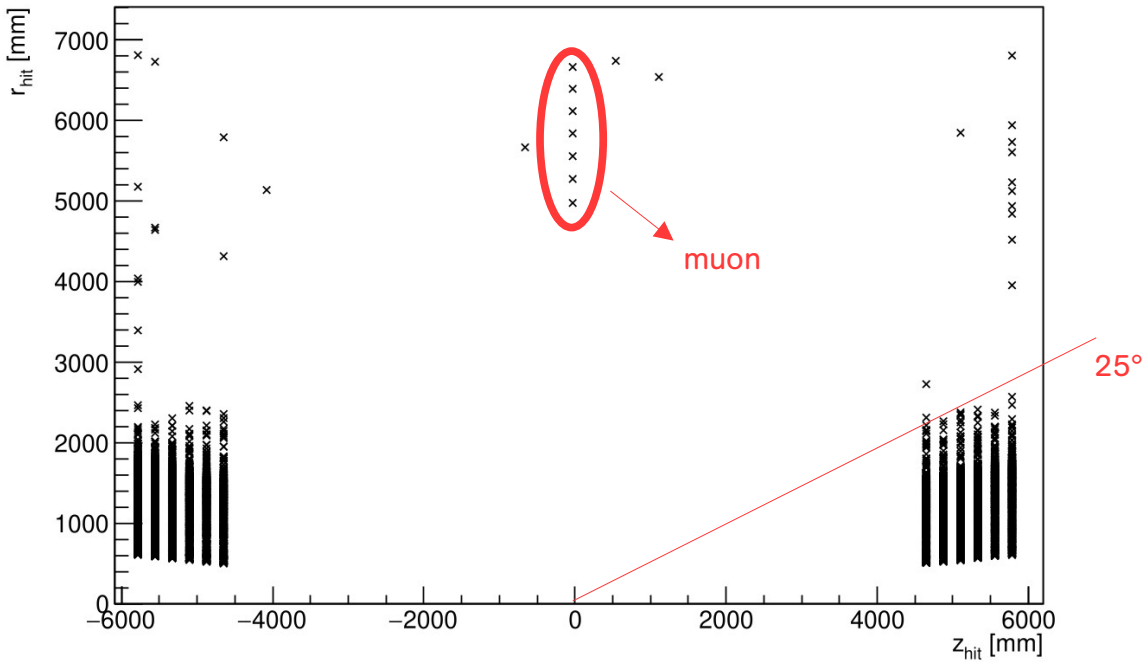
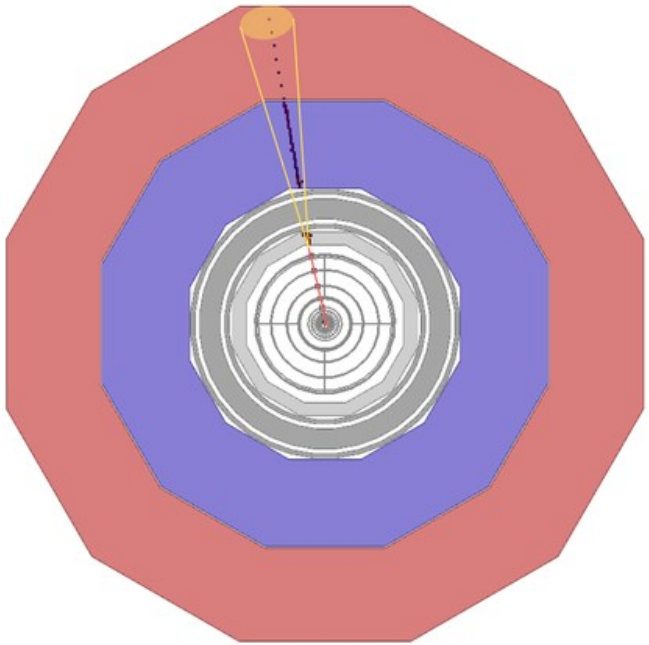
Initial assessment

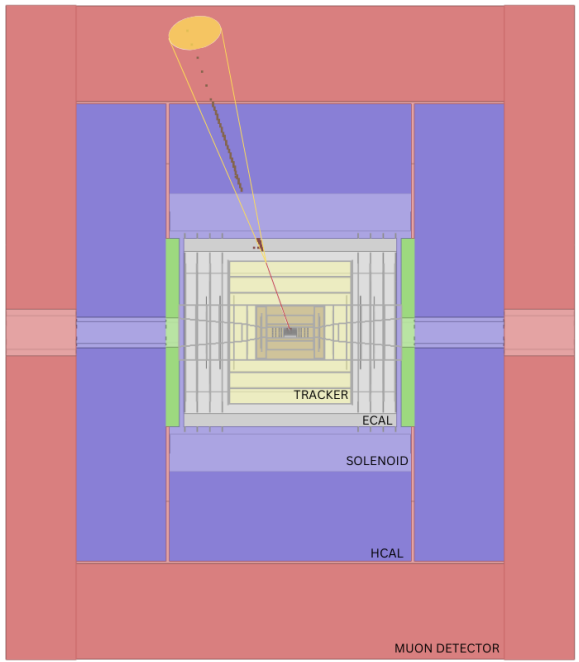
muon detector hits in one event of single muon + beam-induced bkg + incoherent e^+e^- pairs



- Muons can be identified by matching tracks to hits in the muon detectors.

A simple algorithm for muon ID

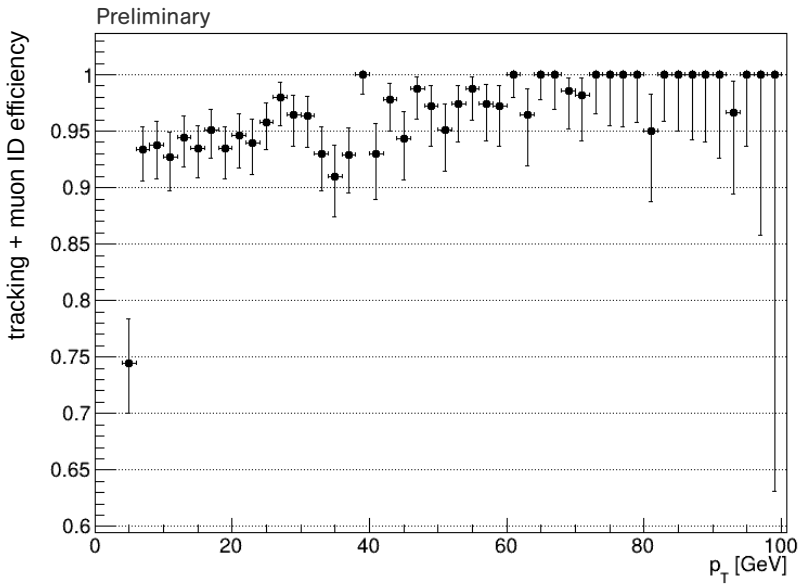


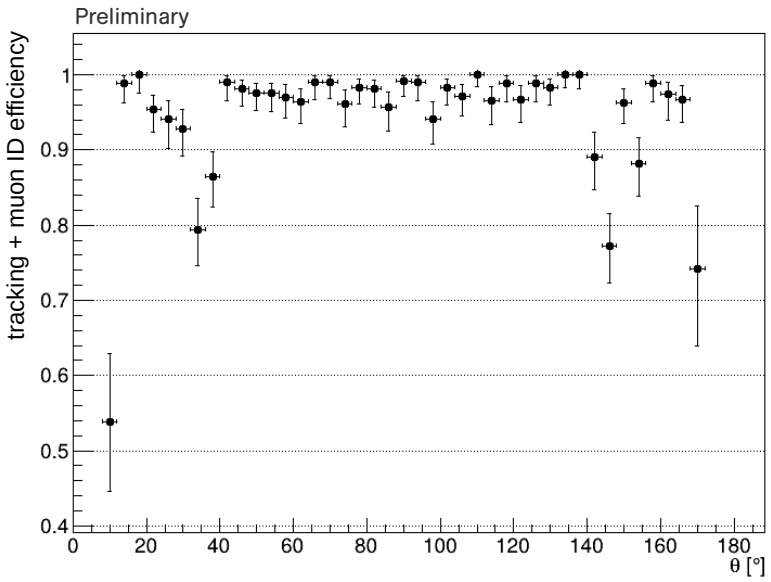


- We start with a basic algorithm:
  - extrapolate tracks to the ECAL inner surface (done by ACTS);
  - open a cone at the intersection point around the flight direction of the particles ($\Delta R < 0.25$);
  - look for muon detector hits inside the cone ($N_{hit} \geq 5$).

Muon ID efficiency

- 4.2k single muons + BIB + IPP, generated at (0, 0, 0) with $4 < p < 100$ GeV and $10° < \theta < 170°$:
  - track selection: $|d_0| < 0.1$ mm and $|z_0| < 0.1$ mm;
  - track-particle angular matching ($\Delta R < 0.05$).





Backup

Muon-ID efficiency turn-on