

# mCBM Beam Time 11 March 2025

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CBM Online Meeting, 13 March 2025

# Online Processing: Configuration

- Timeslice reconstruction (sts / trd / tof / tracking)
- V0 topology trigger
- Online event reconstruction and QA
- No event selection

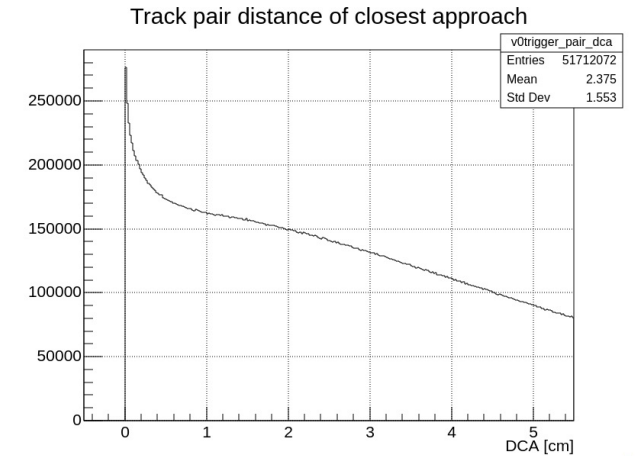
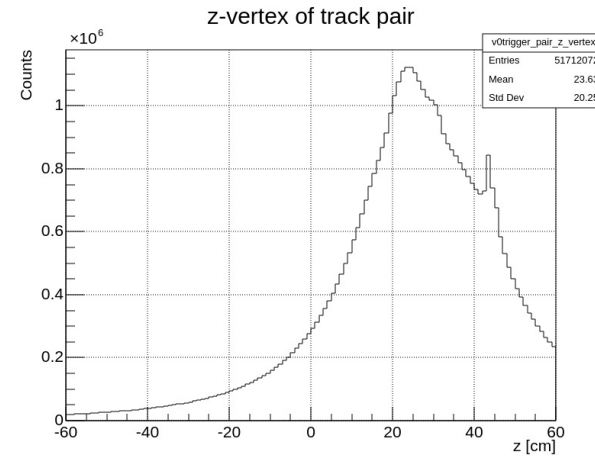
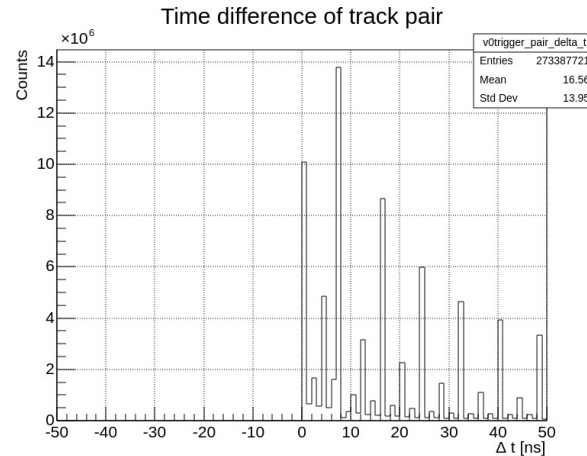
# V0 Topology Trigger

- Process tracks produced by CA (timeslice reconstruction)
- Single track cuts
  - First z coordinate:  $-10 < \text{track.fParFirst.Z}() < 50$  (to ensure track starts with STS)
  - Last z coordinate: not used (open cut)
  - Impact parameter in x and y  $> 1$  cm (to exclude primary tracks)
- Track pairs cuts
  - $\Delta t < 20$  ns (to exclude track pairs from different events)
  - Distance at point of closest approach  $< 0.5$  cm
  - $4 < z$  position of PCA  $< 50$  (to exclude track pairs from target)

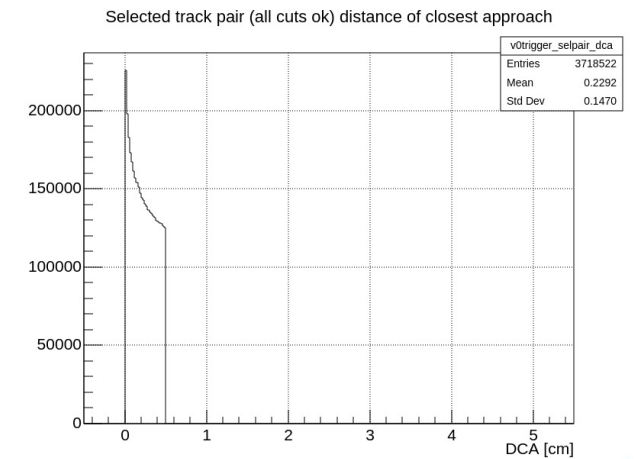
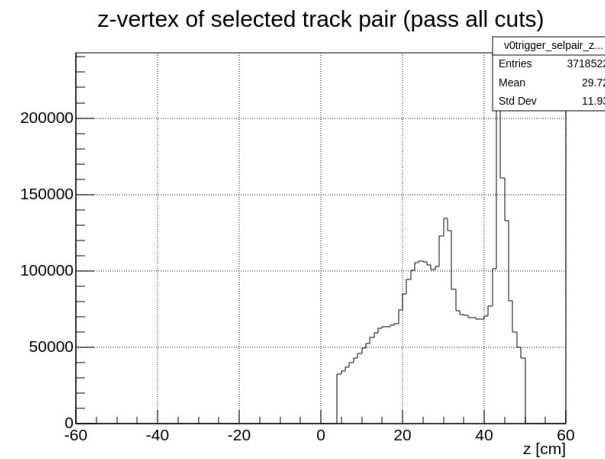
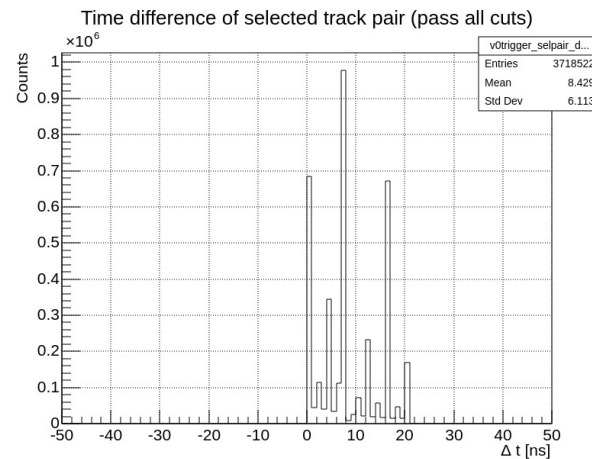
```
v0trigger:
  track_start_z_min: -10
  track_start_z_max: 50
  track_end_z_min: -50
  track_impact_x_min: -1
  track_impact_x_max: 1
  track_impact_y_min: -1
  track_impact_y_max: 1
  pair_deltaT_max: 20
  pair_dist_max: 0.5
  pair_z_min: 4
  pair_z_max: 50
```

# Trigger variables (Online Histogram Server)

before cuts



after all cuts



After time and distance cut, the material distribution becomes visible (conversion pairs).

# V0 Trigger: Issues

- Spiky structure in the  $\Delta t$  distribution?
- Need to study  $\Delta t$  distribution on much larger scale in order to define a sensible cut on same-event track pairs.
- Optimise impact parameter cuts
- Neglect material region ( $z > 20$  cm)?

To be addressed offline.

# Offline Programme

- Study and understand distributions of cut variables.
  - Run binary from tsa with timeslice tracking, but w/o trigger; analyse tracks in cbmroot
- Define proper cut variables
  - Need not be optimised to the ultimate level; study data suppression as function of cuts
- Re-run data processing offline with proper trigger settings.
- Analysis of triggered events with KFPP (Lambda).

Once this is carried out, do a replay data challenge to study performance and load on compute nodes:

- digi multiplicity trigger
- V0 topology trigger

Compare Lambda inv. Mass with both settings (selling plot for ECE May 2025).