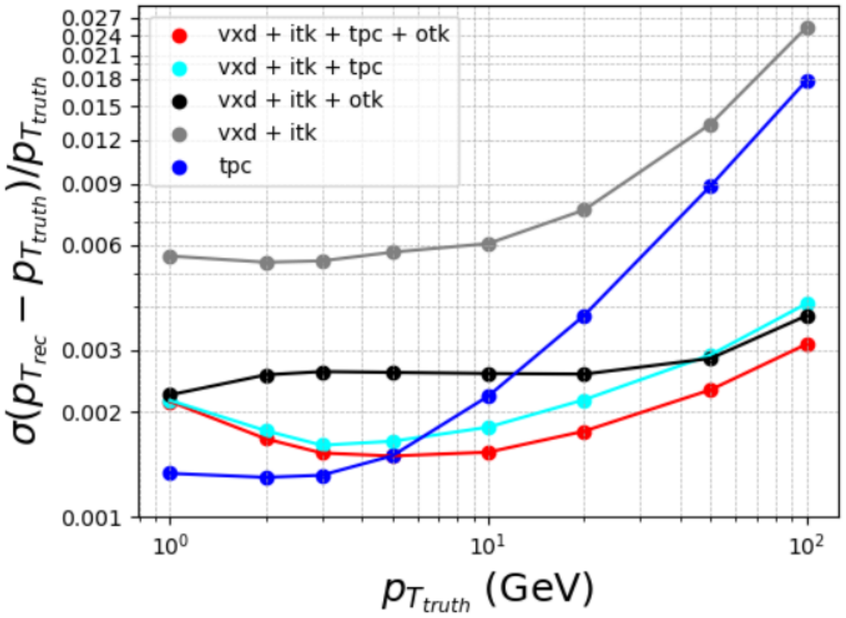
Trk, Vtx, PID

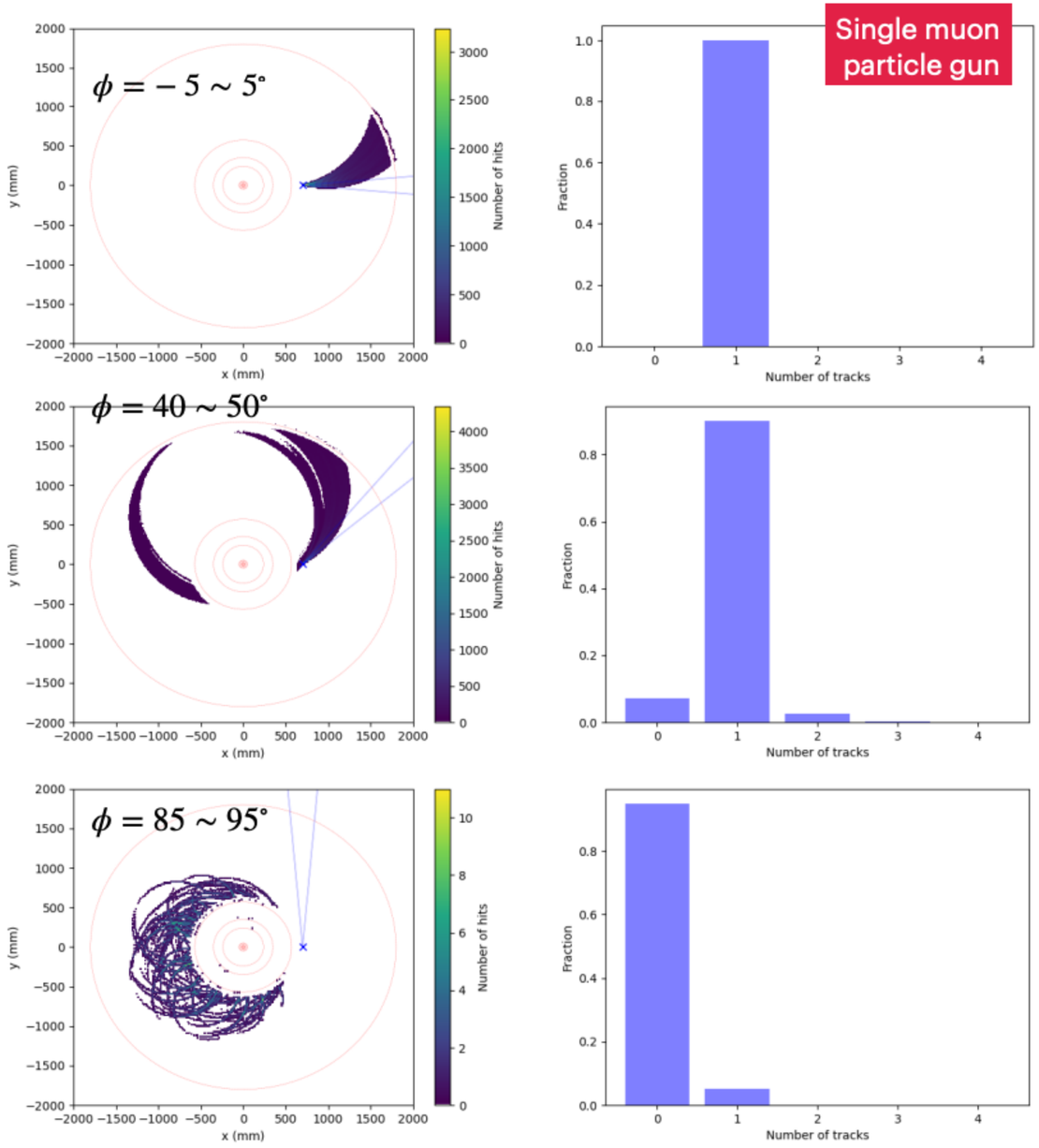
C.Zhang/16Dec2024

Trk

- Release validation for 24.12.0 tracks
  - Low pT region issue is still ongoing



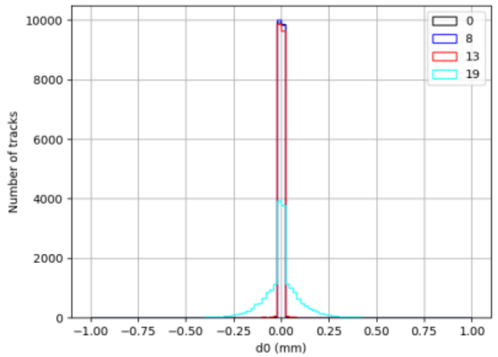
- Took a look at the multi-track issue, it seems to be related to the phi direction of incident particle in the gas chamber
  - Further studies are ongoing

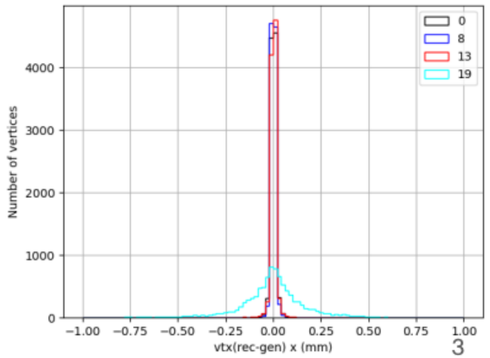


Vertex

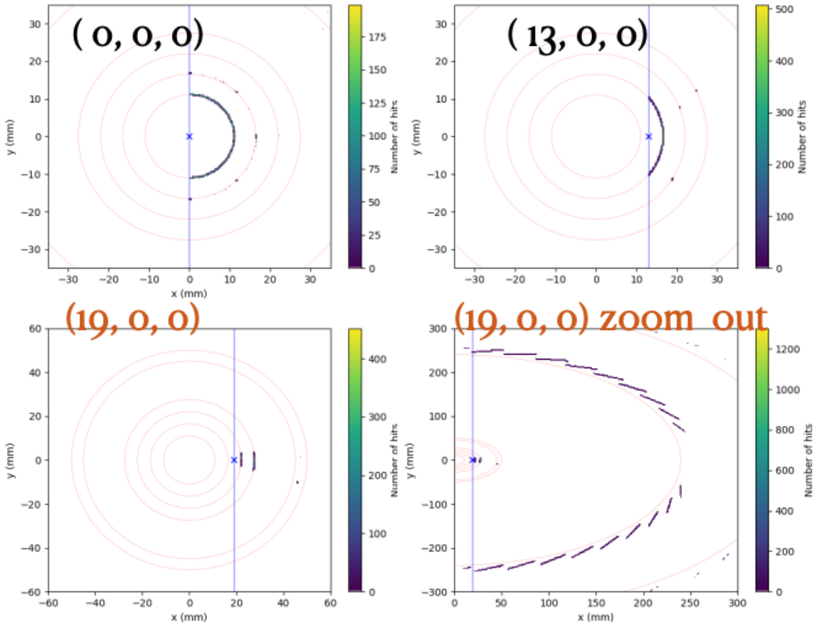
- Have gained a better understanding of the precision of secondary vertices
  - Precision drop between R=13 and 19 mm is caused by the absence of the expected innermost hit
  - Investigating the reasons behind these missing hit
- Performance of vertices in cascade decay is being tested

- $\phi_{\mu^+,\mu^-} = -90 \sim 90, \theta_{\mu^+} = 95, \theta_{\mu^-} = 85$, pT=2-5GeV, position (x, 0, 0)
- The order of precision between d_0 and vertex agree with each other
- Precision drops rapidly between 13 and 19





The first hit assigned to TrackState::AtFirstHit



- For muons originate from (19, 0, 0)
  - Expect all first hits to be located around VXD-L3/4, but only 10% are actually there; the rest are around ITK-L1
  - Muon pairs at 100GeV give the same results

PID

Xiaotian Ma

PID efficiency comparison

- Took a look at the PID performance with $Z \rightarrow qq$ events
- Overall, the performance is slightly worse than the preliminary studies conducted using particle gun
  - Studies on the efficiency loss in the low pT region is ongoing
- The dN/dx algorithm needs to be optimised to meet the target (Kaon efficiency/Purity > 90%)