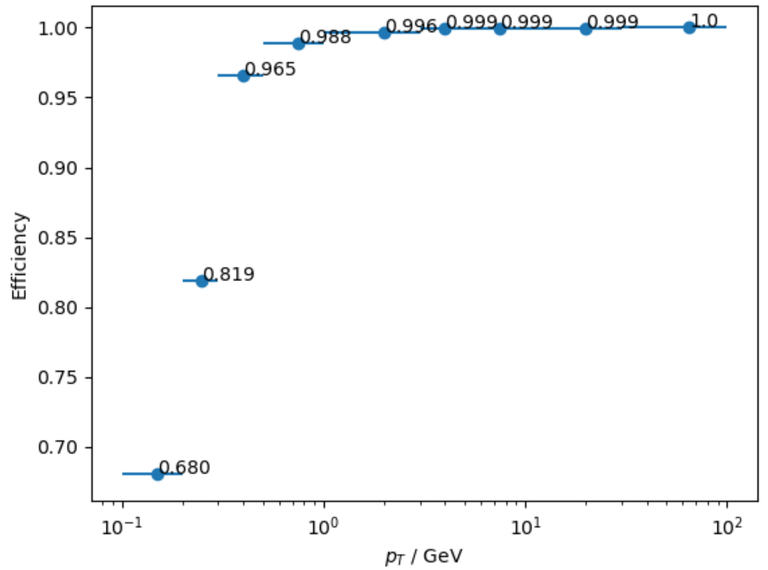
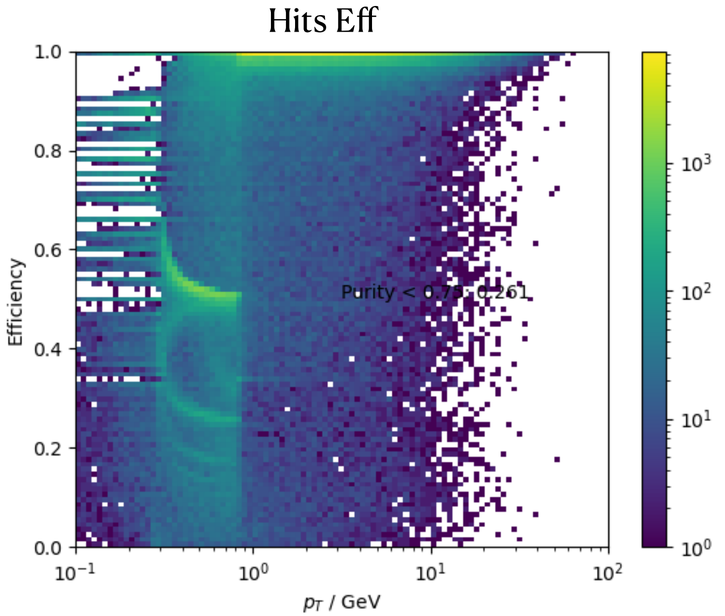
Trk & Vtx

C.Zhang/21Feb2025

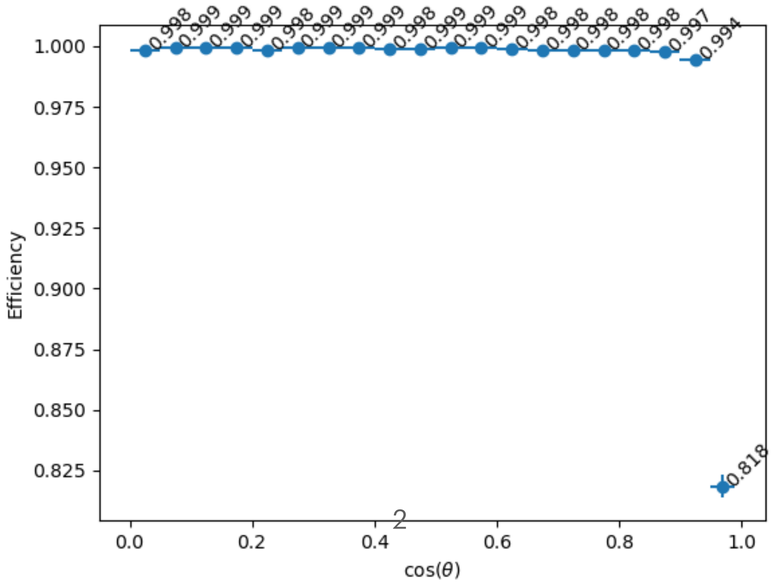
Tracking Efficiency

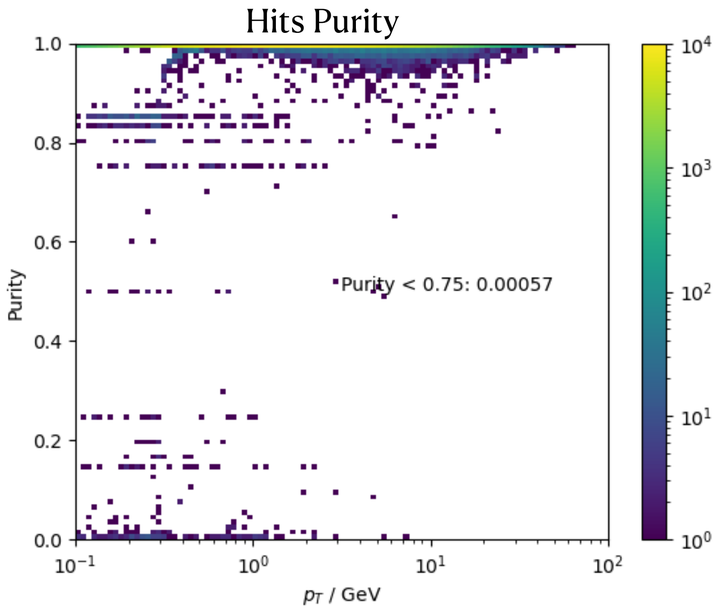
- SW.12.1.2 with eebb events
  - track hits efficiency: weight/N-MCHits
  - track hits purity: weight/N-TrackHits
  - weight : the number of hits shared by a MC and a rec-trk (one track can share hits with many mc, we select the largest one)





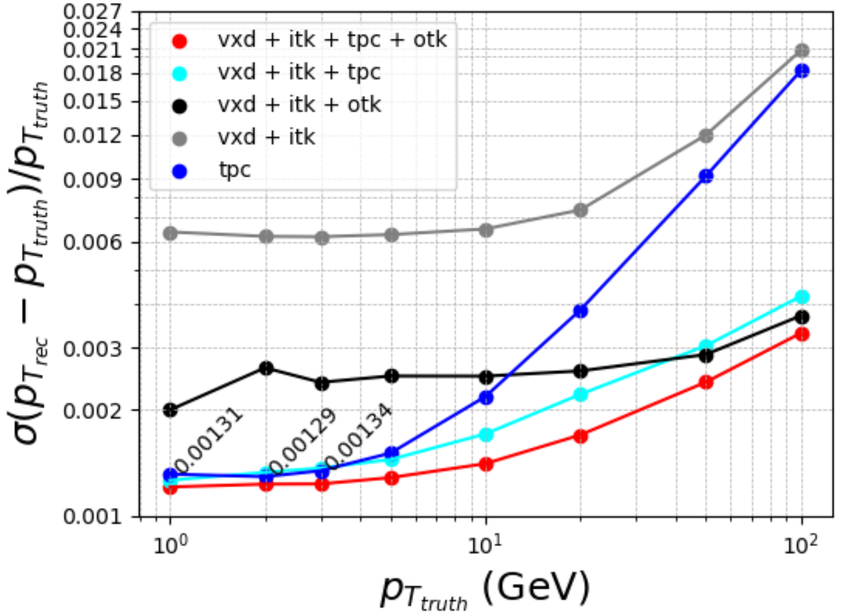
- Track efficiency: Ntrk (purity > .75) / N-MC (charged, stable, costheta < 0.99, pT>100MeV)
- Error bar defined as Binomial Uncertainty : $\sqrt{\frac{e(1-e)}{N}}$



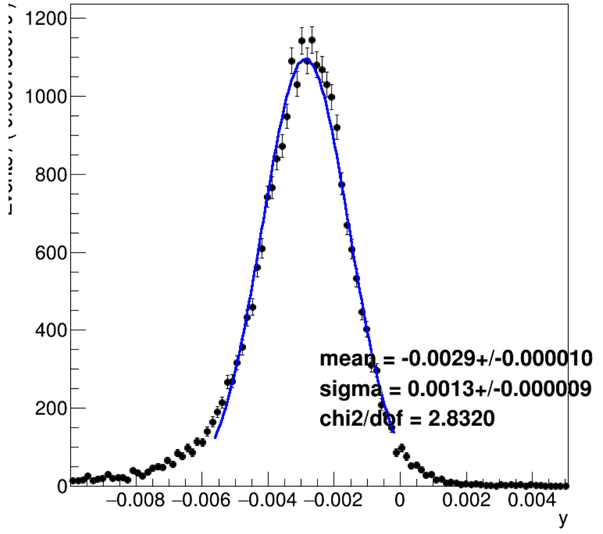


SW 25.1.2 +MR198

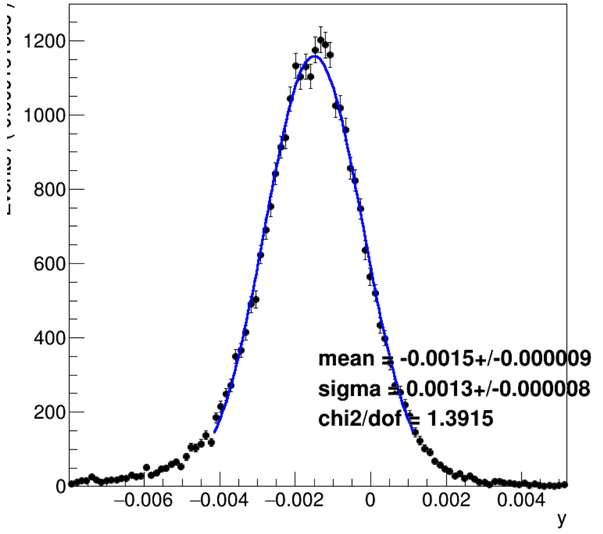
TPC Tracking @ Low pT, 85°

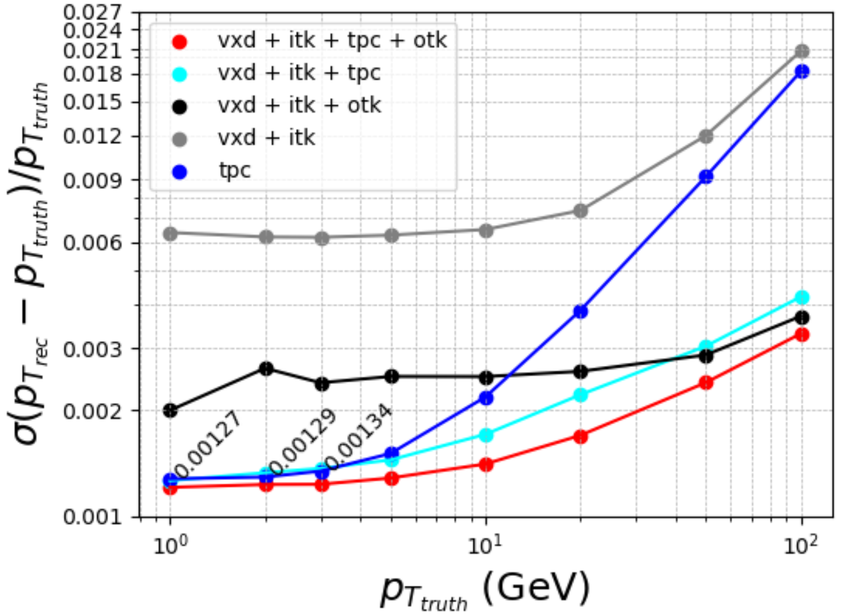


TPC tracking resolution @ 1GeV

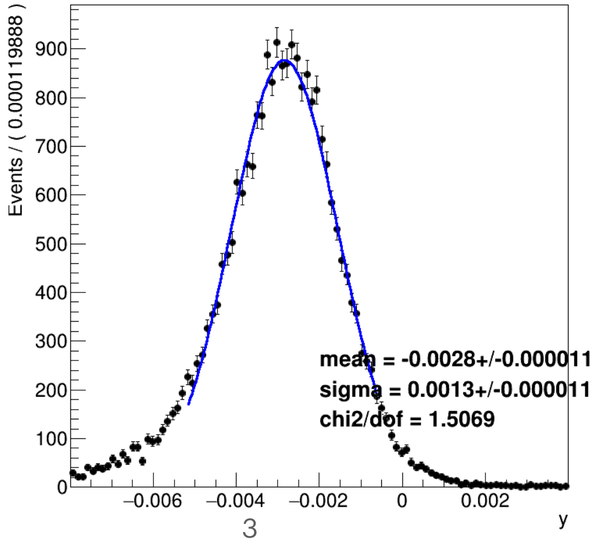


TPC tracking resolution @ 2GeV





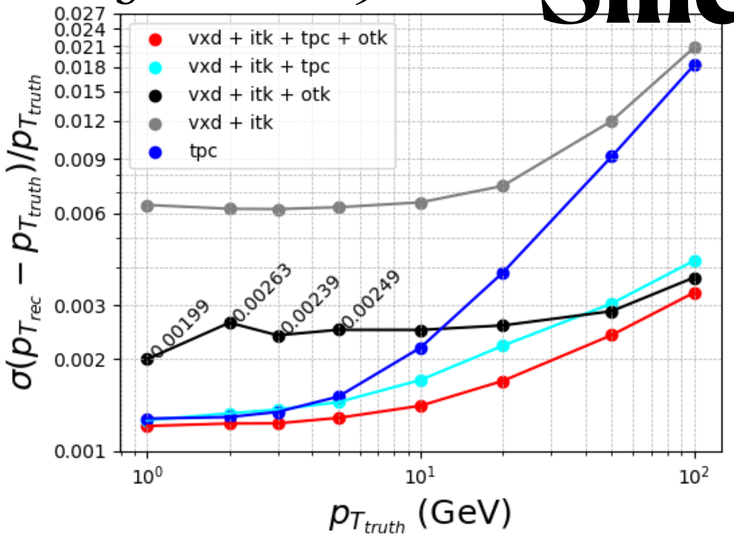
tpc

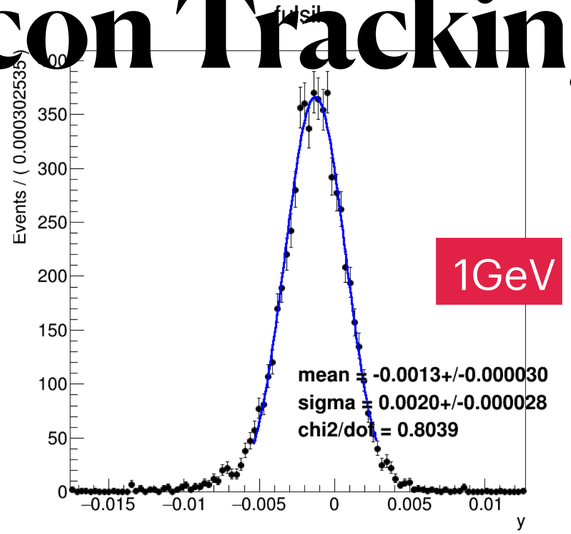


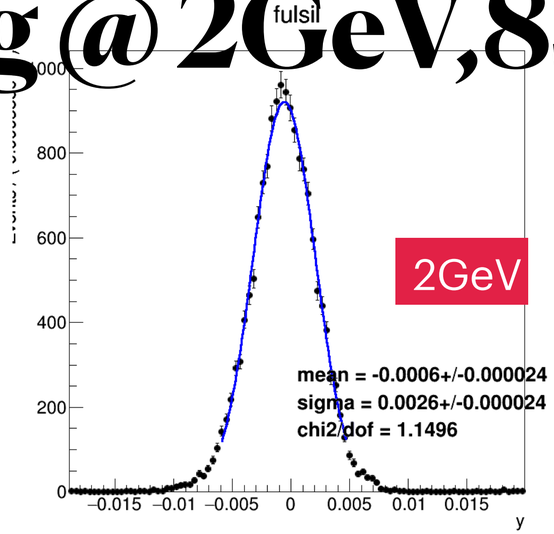
- Narrow the fit-range from 2 sigma to 1.7 sigma
- Reduced-chi2, 2.8 -> 1.5

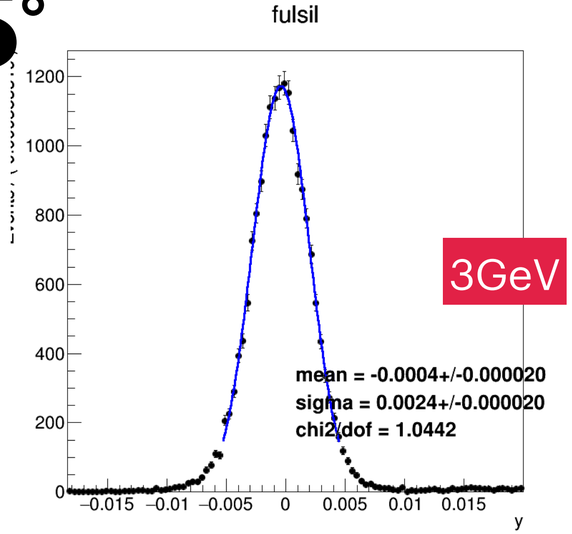
Silicon Tracking @ 2GeV,85°

SW 25.1.2 + MR198

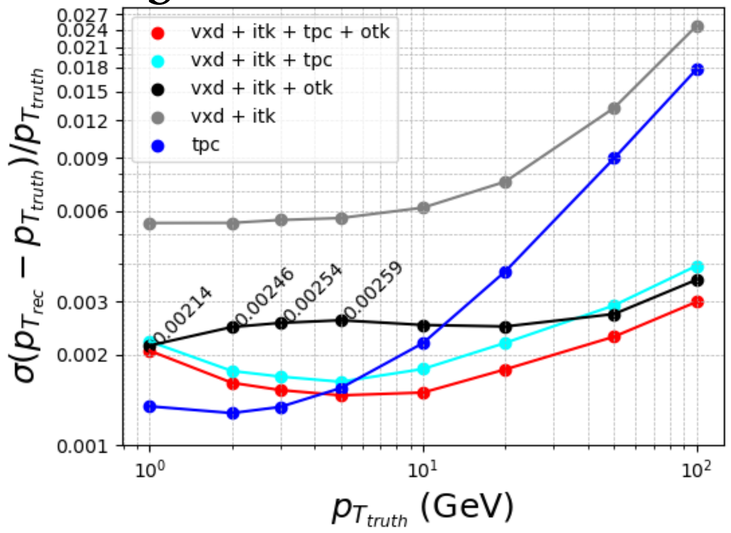


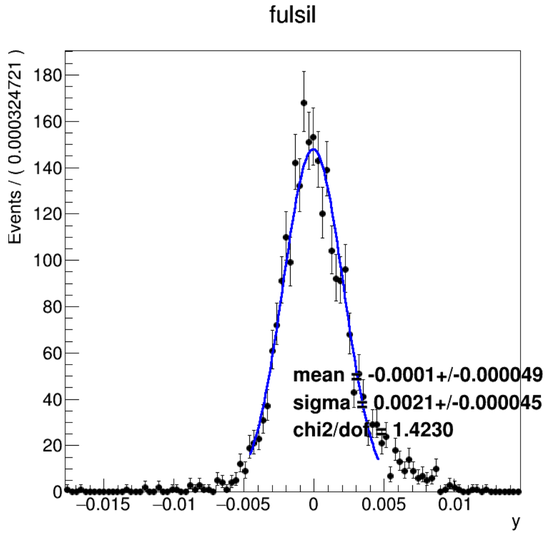


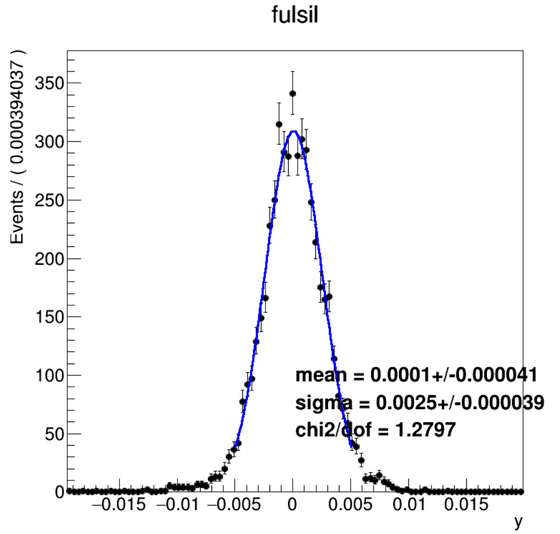


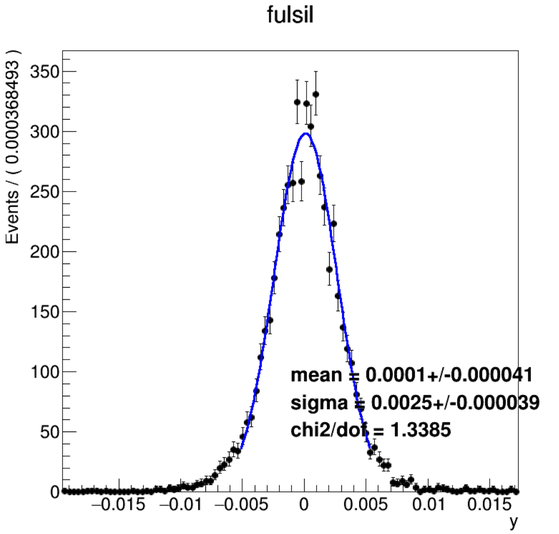


SW 25.1.2



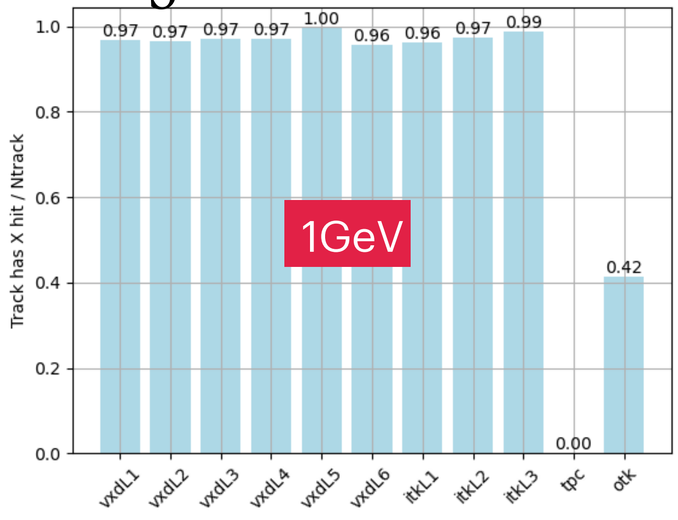


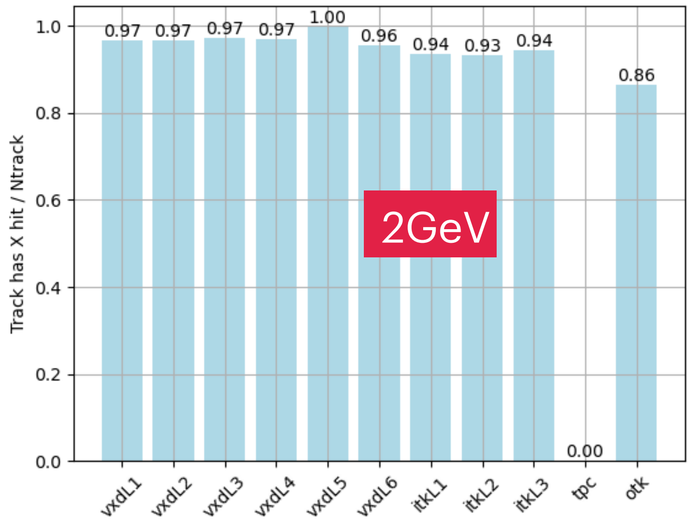


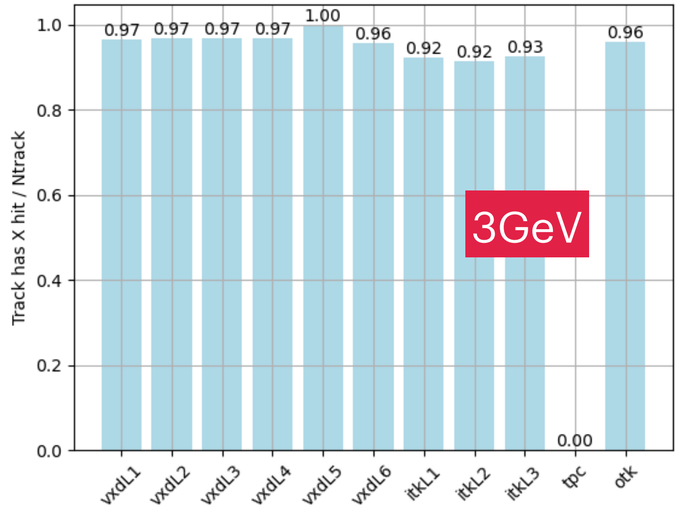


Silicon Tracking @ 2GeV,85°

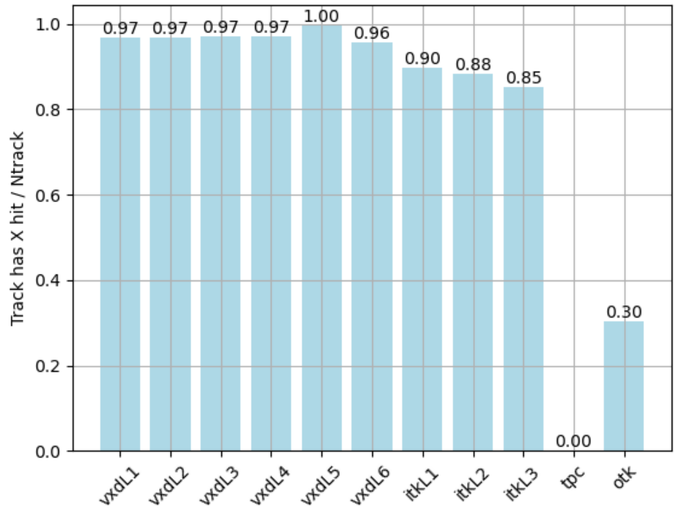
SW 25.1.2

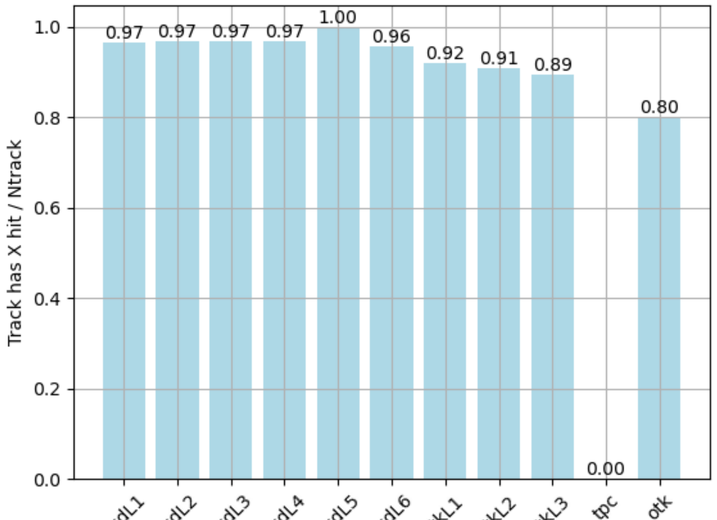


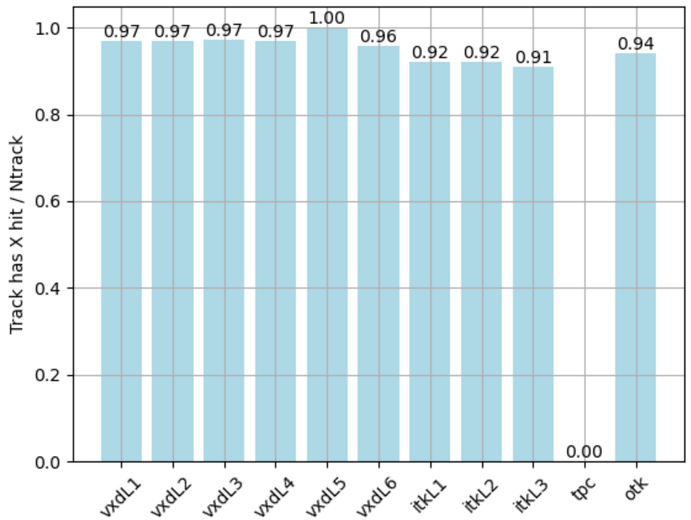




SW 25.1.2 +MR198

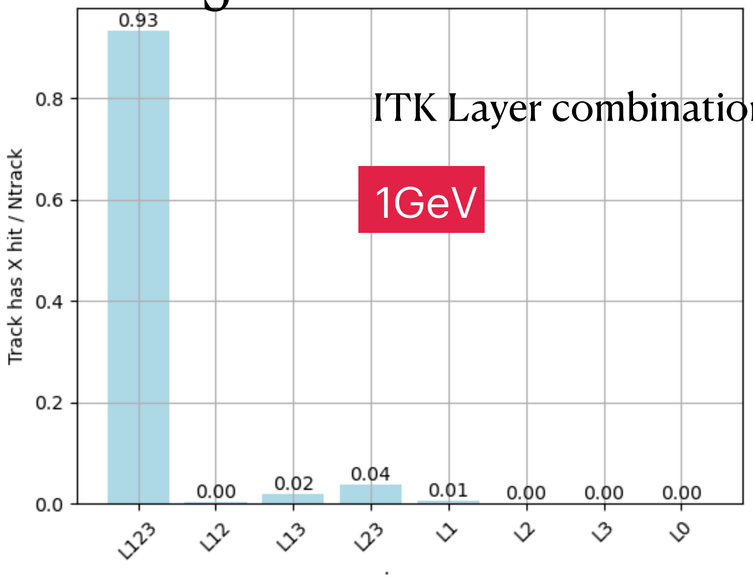


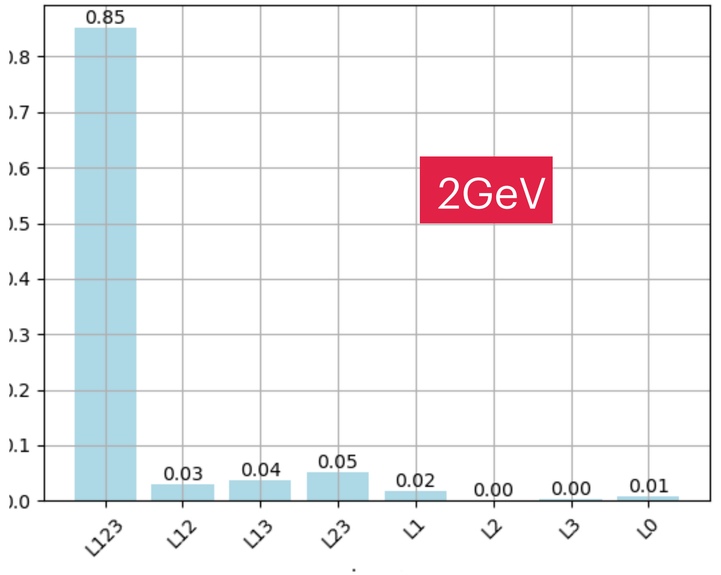


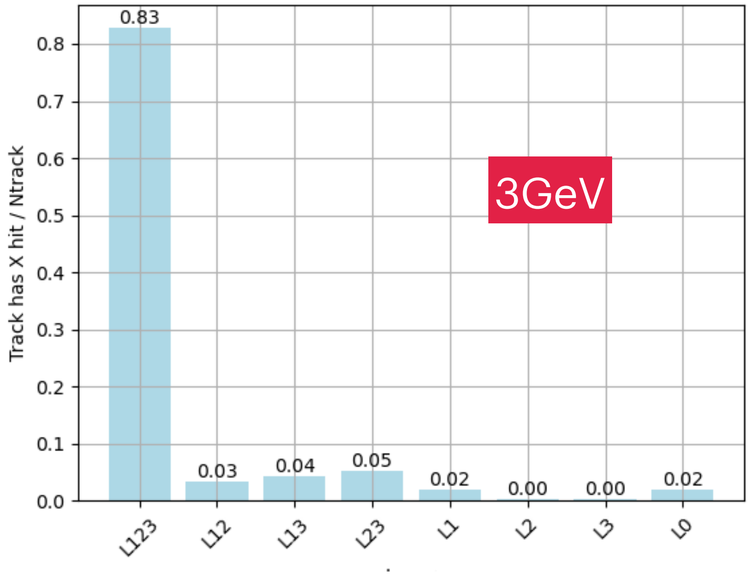


Silicon Tracking @ 2GeV,85°

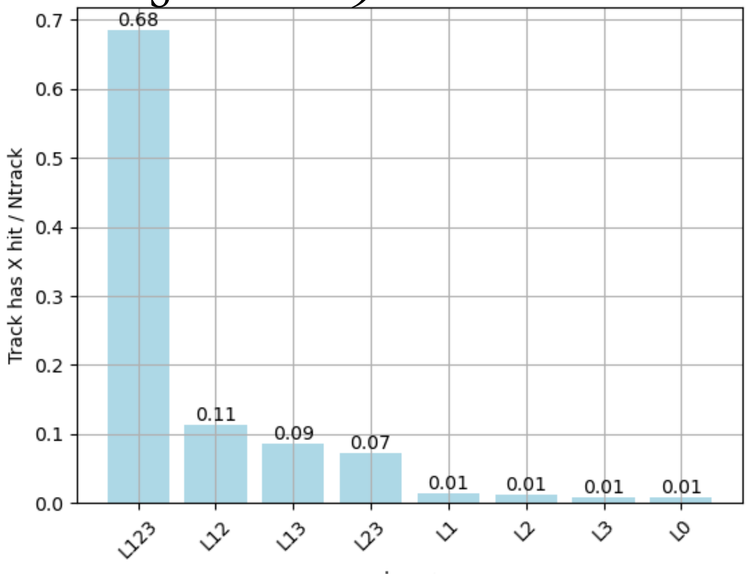
SW 25.1.2

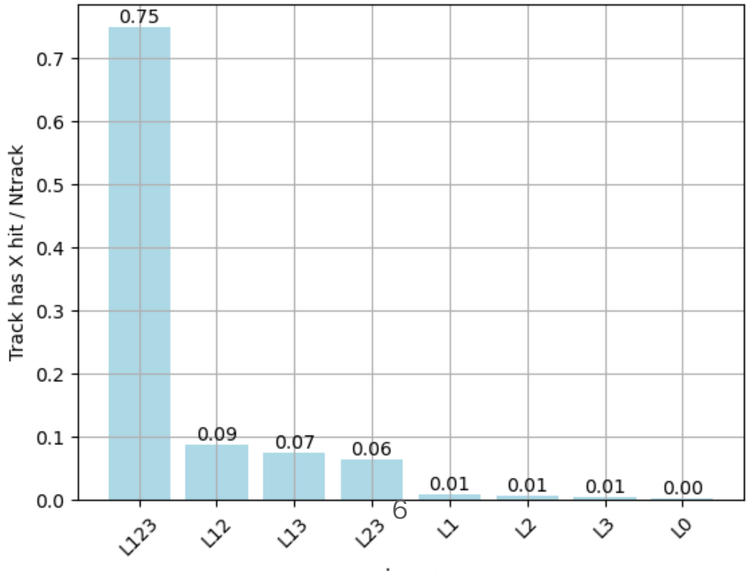


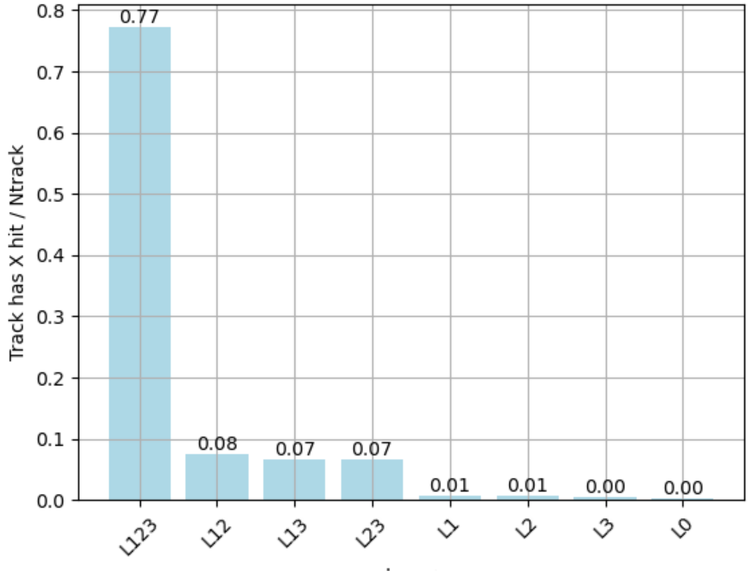




SW 25.1.2 +MR198







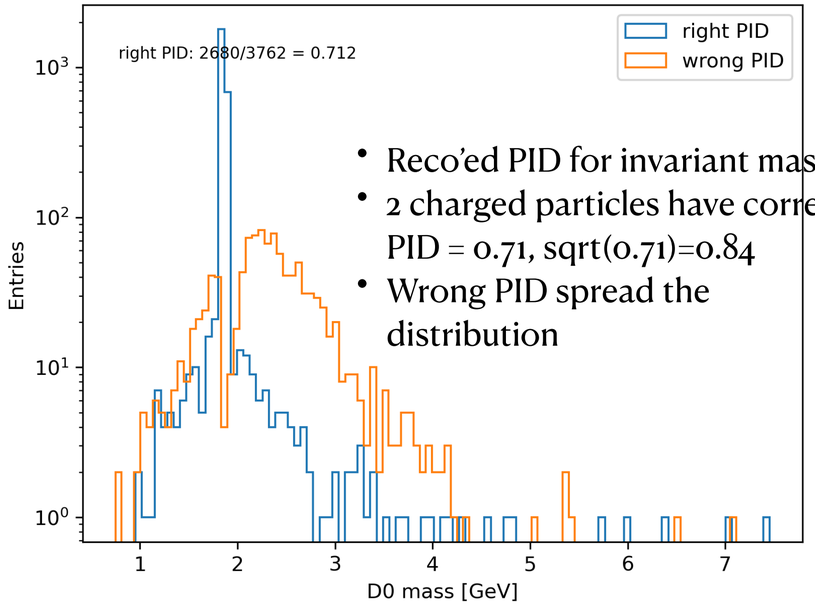
D_0 Reconstruction (eebb)

- Relevant processes, $D_0 \to KK, \pi\pi, \pi\pi\pi^0, K\pi\pi^0$

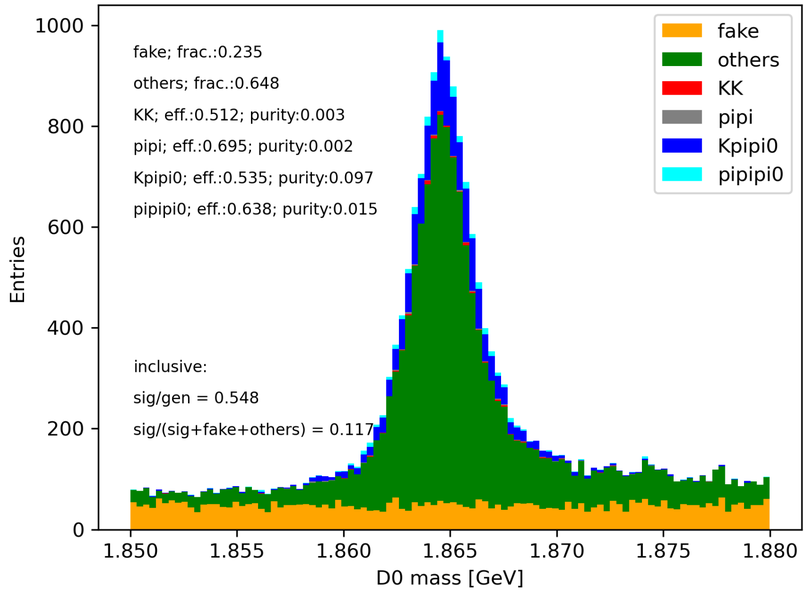
eebb	D0->KK	D0->pipi	D0->kpipi0	D0->pipipi0
25000	129	59	3687	480
Reco'ed	120	53	3179	410

	Global efficiency	SV algorithm efficiency	
Events with two tracks reconstructed	94 %		
Vertex reconstructed	87 %	93 %	7% tracks used by prim vtx

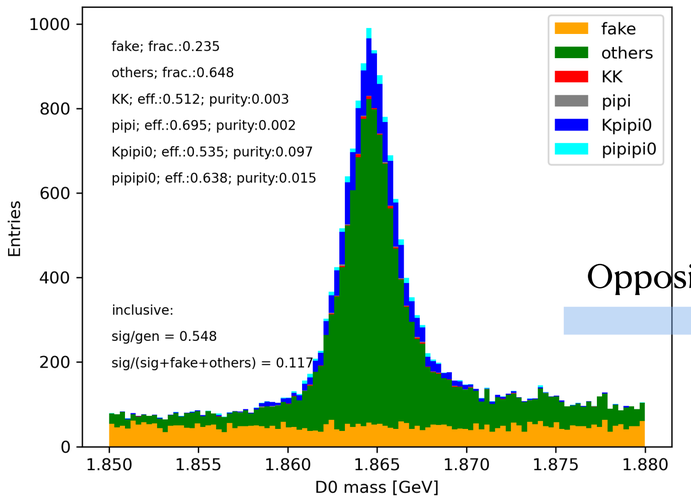
- After PV, enumerate all remaining track pairs
- Match rec-gen tracks using MC hits
- fake: the two gen tracks have different starting points
- others: the two gen tracks share the same starting point, but decay is not of interested (events with > 3 tracks can be reconstructed multiple times, also classified as "others")



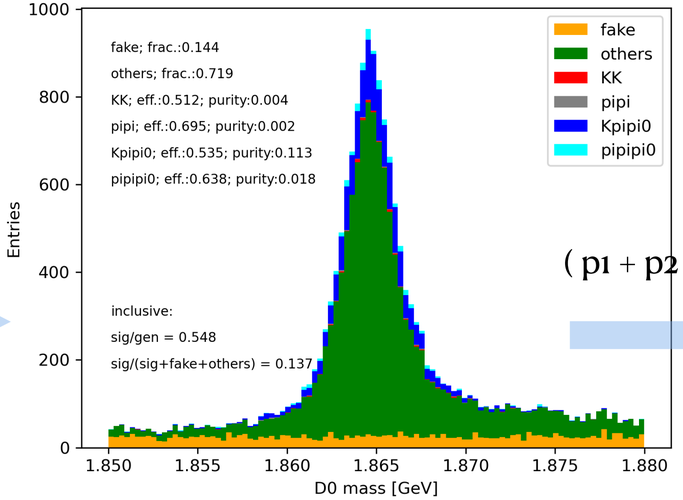
- Reco'ed PID for invariant mass
- 2 charged particles have correct PID = 0.71, sqrt(0.71)=0.84
- Wrong PID spread the distribution



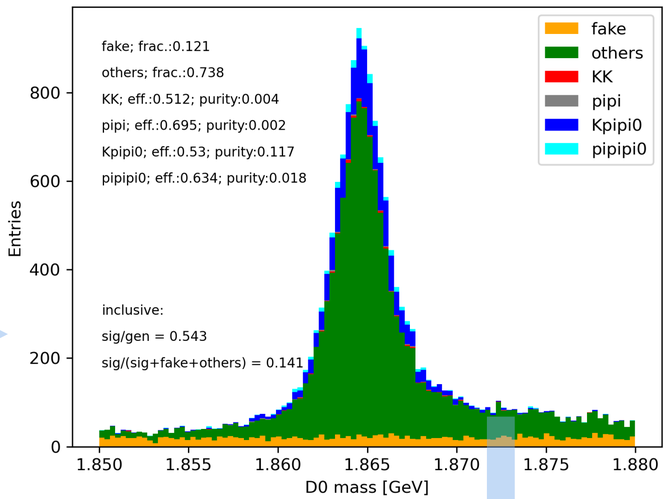
D_0 Reconstruction (eebb)



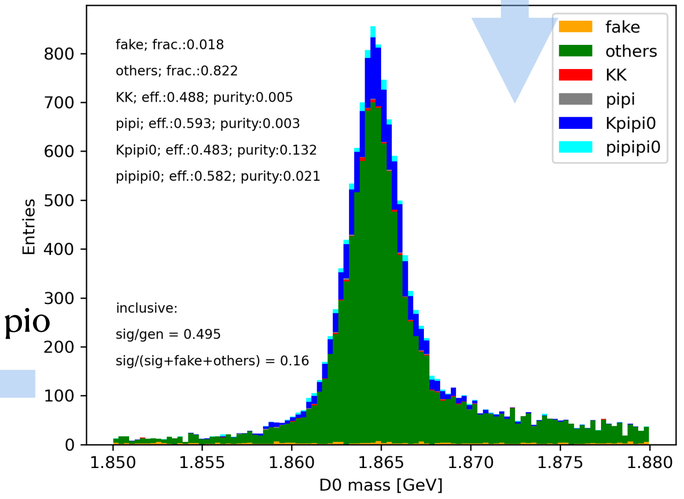
Opposite charges



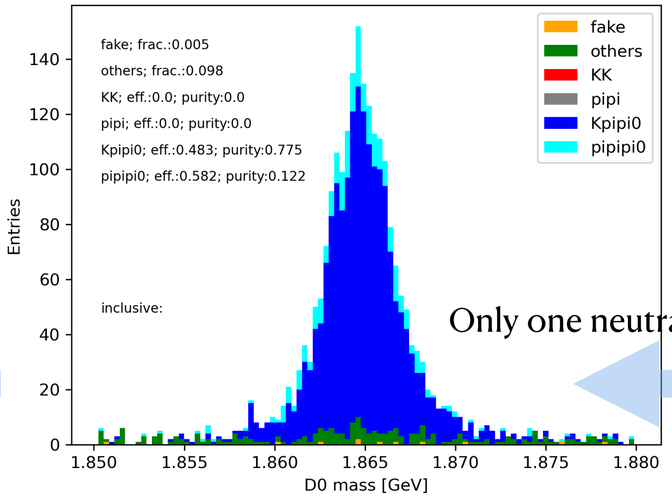
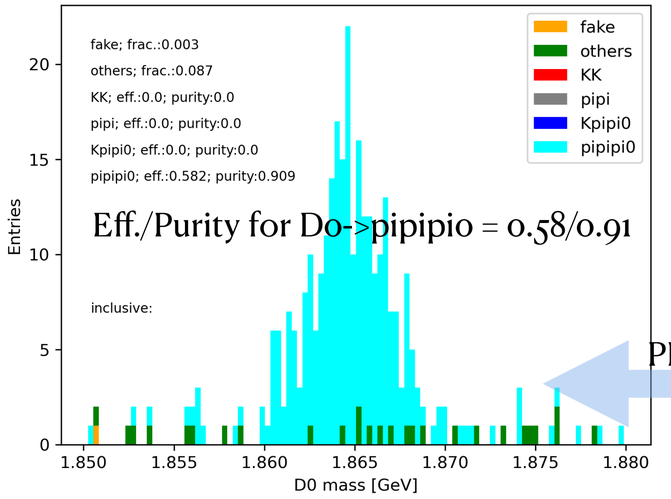
(p1 + p2) dot vtx > 1



chi2(n=1) < 4



Only one neutral particle = pio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