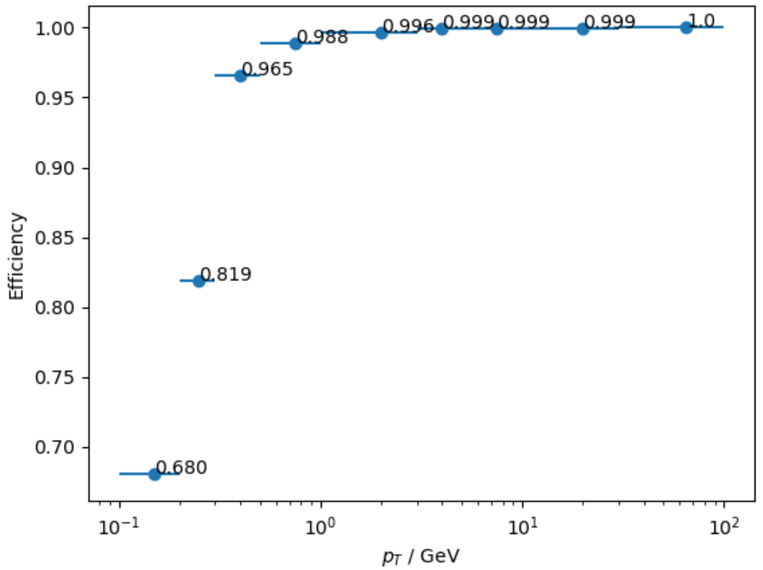
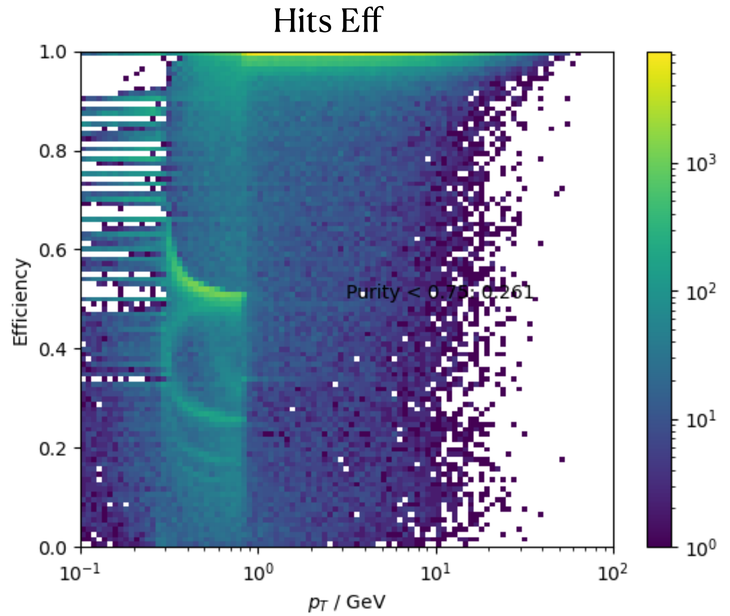
# Trk & Vtx

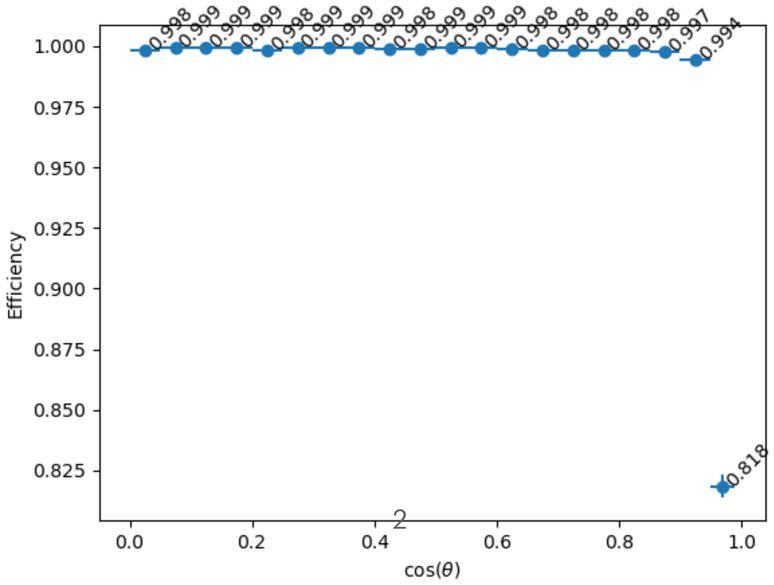
C.Zhang/21Feb2025

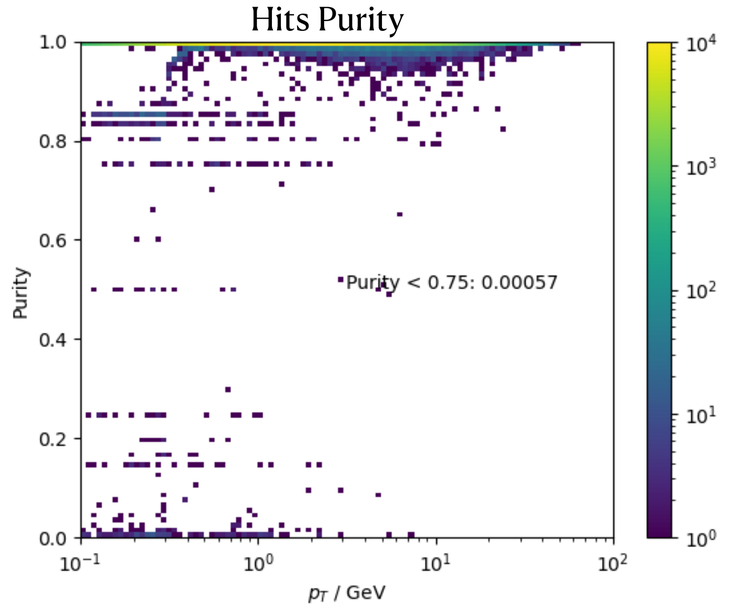
# Tracking Efficiency

- SW.12.1.2 with eebb events
  - weight : The number of hits shared between an MC particle and a reconstructed track (one track can share hits with multiple MC particles, with the one sharing the most hits being selected)
  - track hits efficiency: weight/N-MCHits
  - track hits purity: weight/N-TrackHits
  - Track efficiency: Ntrk ( purity > .75 ) / N-MC (charged, stable, costheta < 0.99, pT>100MeV )
  - Error bar defined as Binomial Uncertainty : $\sqrt{\frac{\epsilon(1-\epsilon)}{N}}$



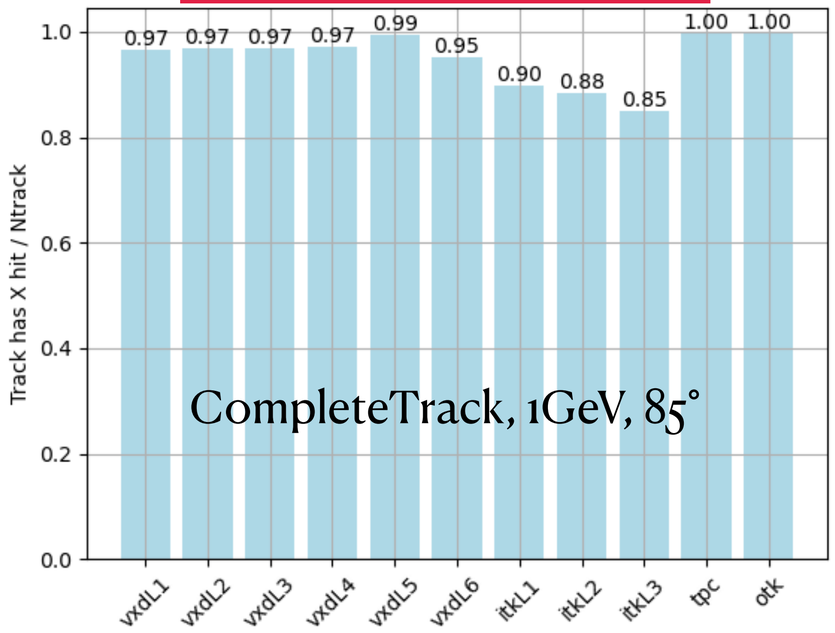



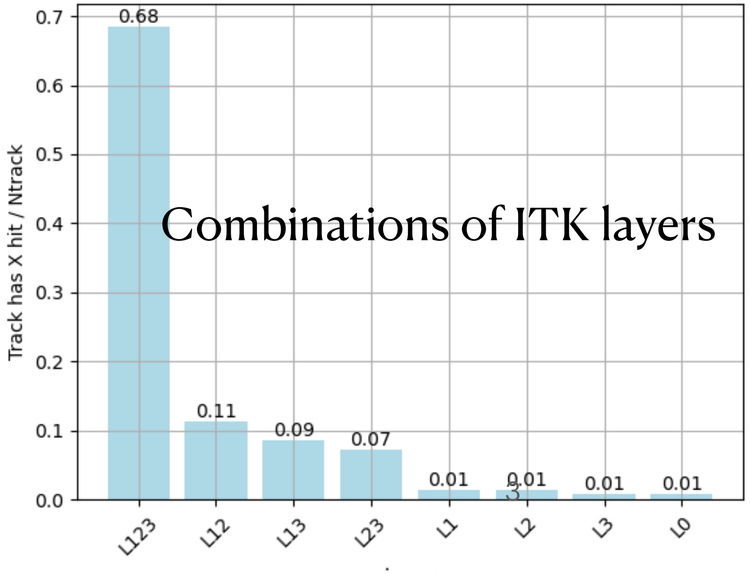



# ITK Hit Efficiency with NEW MR198

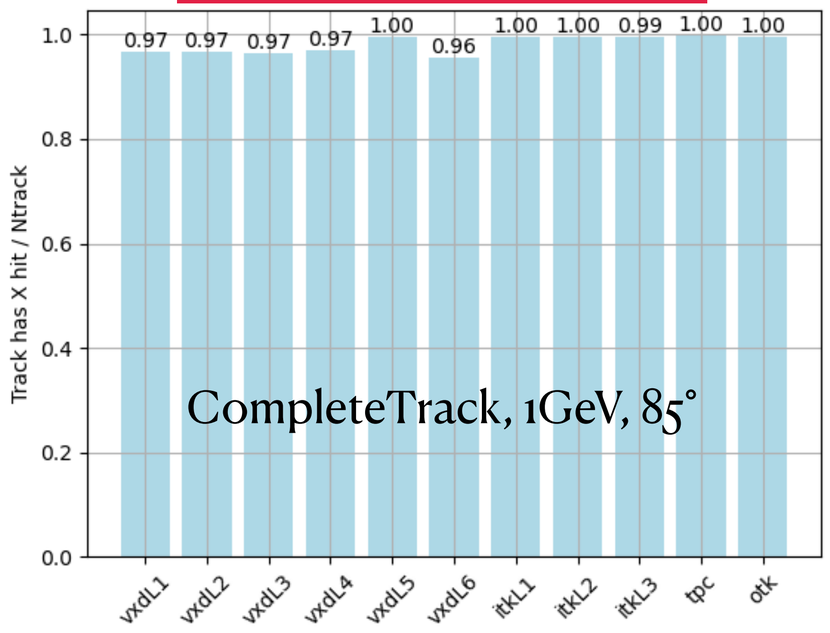
- MR198 was updated last Friday by Chengdong Fu

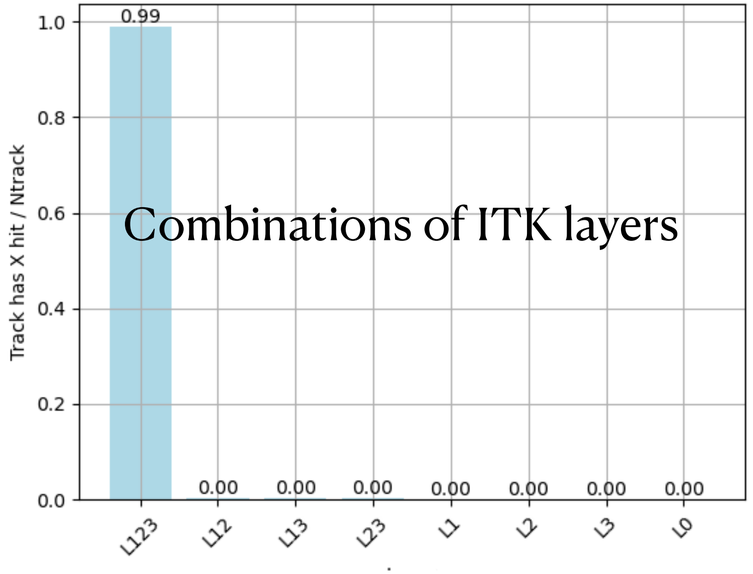
SW 25.1.2 + MR198(Jan26)



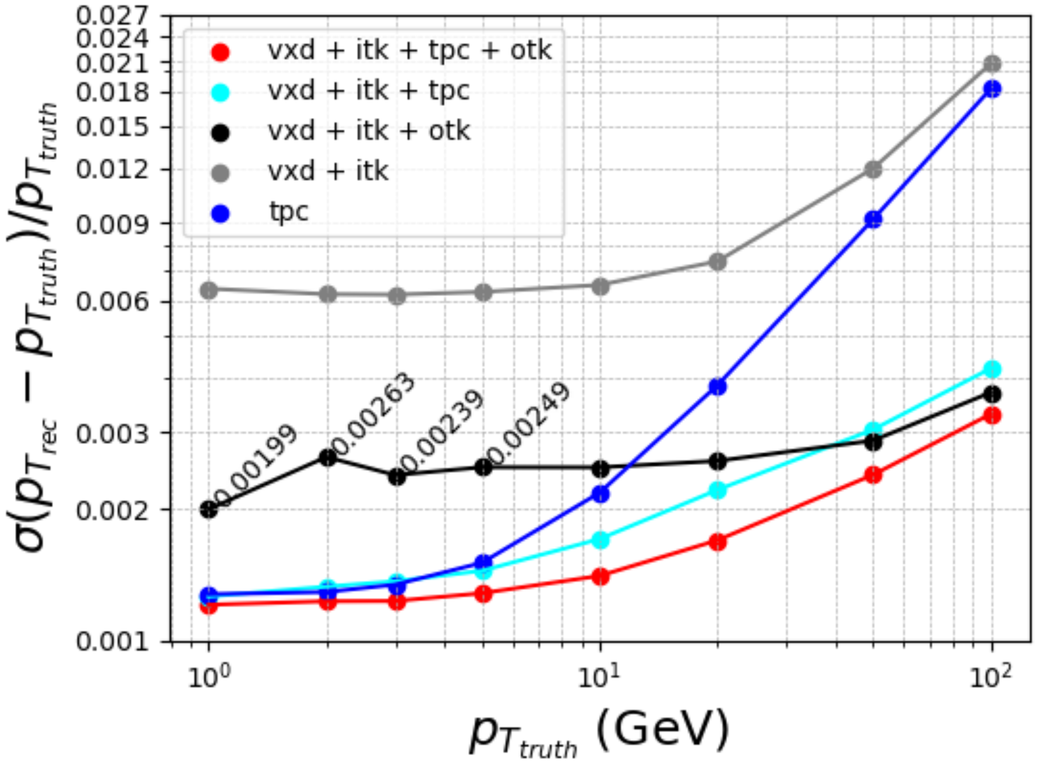

SW 25.1.2 + MR198(Feb21)



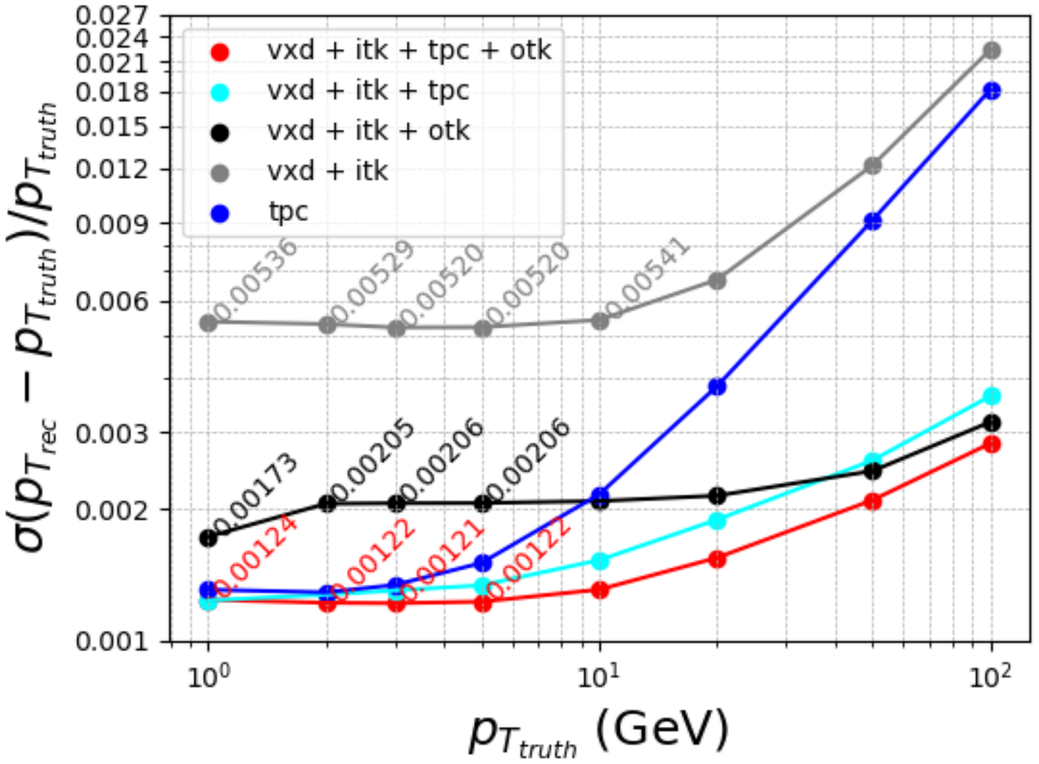



# Tracking Resolution with New MR198

SW 25.1.2 + MR198(Jan26)



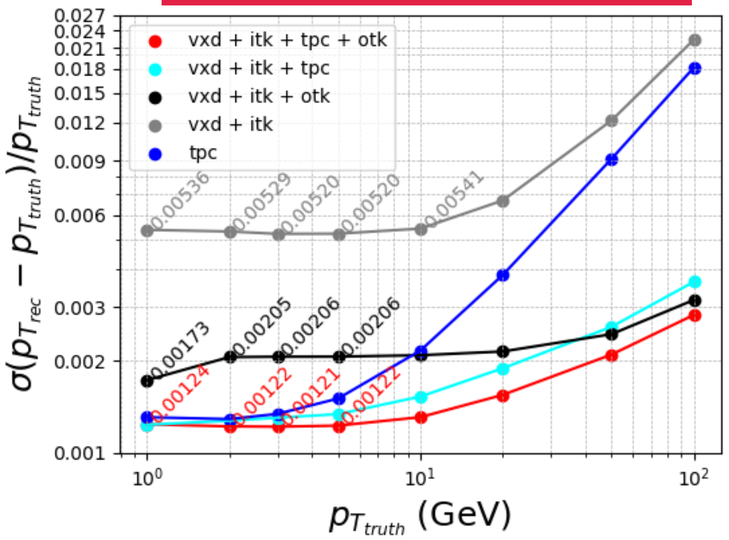

SW 25.1.2 + MR198(Feb21)



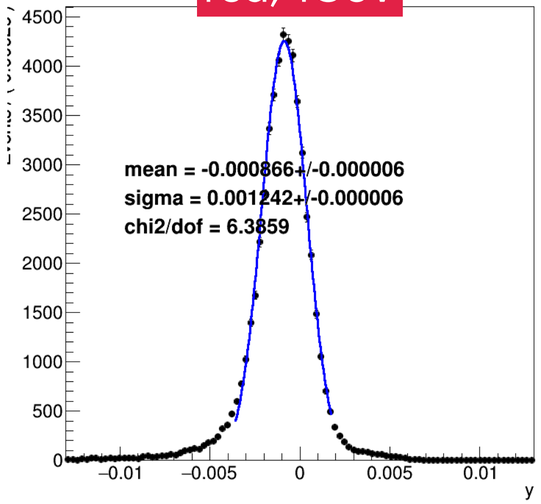

Gaussian fit 2 sigma sub-range

# Tracking Resolution with New MR198

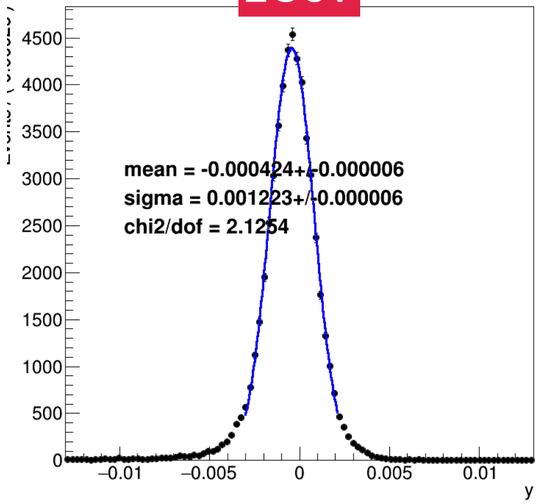
Gaussian; Subrange



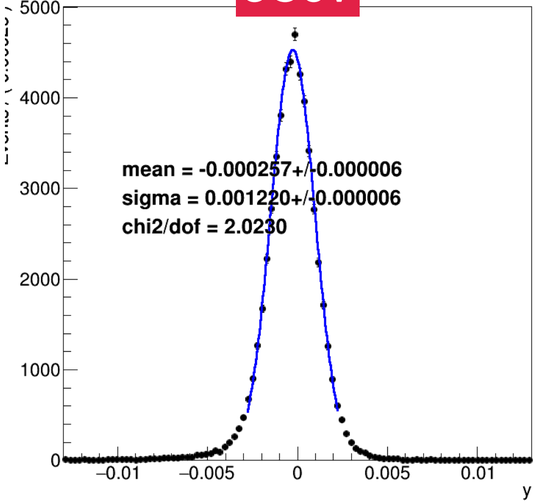

red; 1GeV



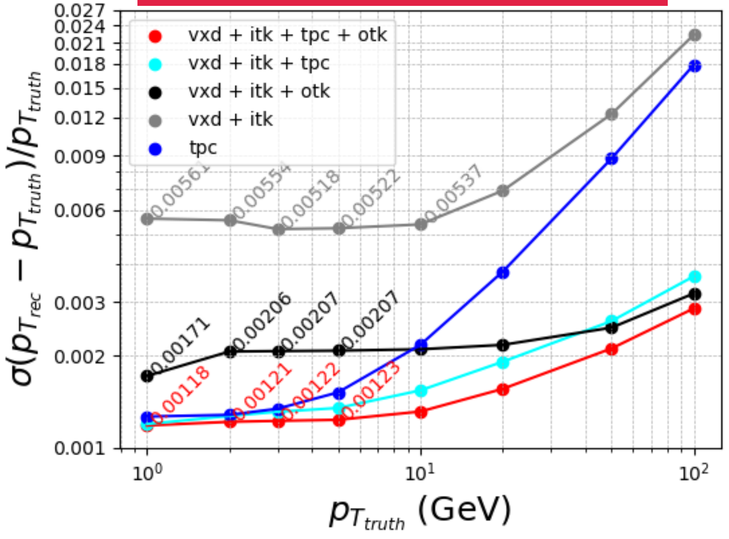

2GeV "y"



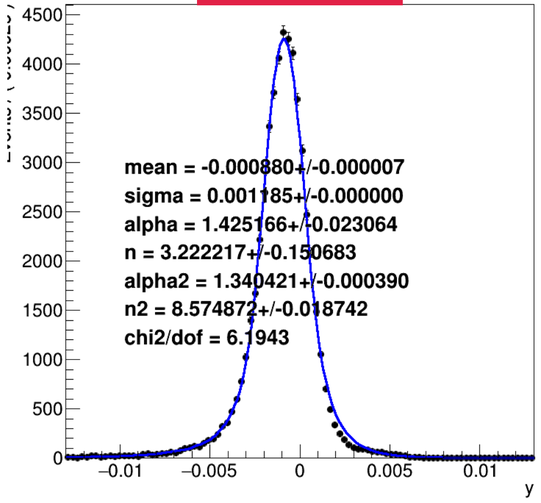

3GeV "y"



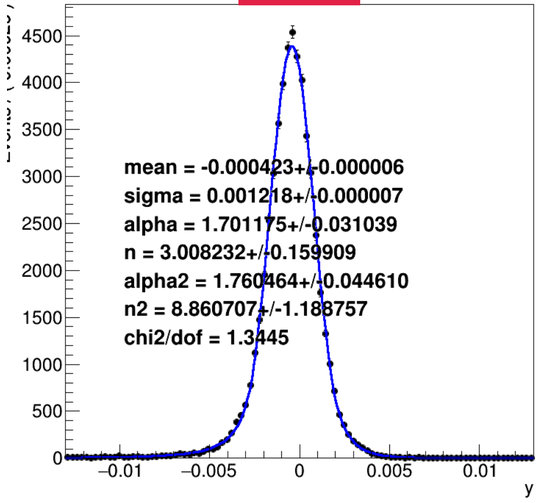

DSCB; Fullrange



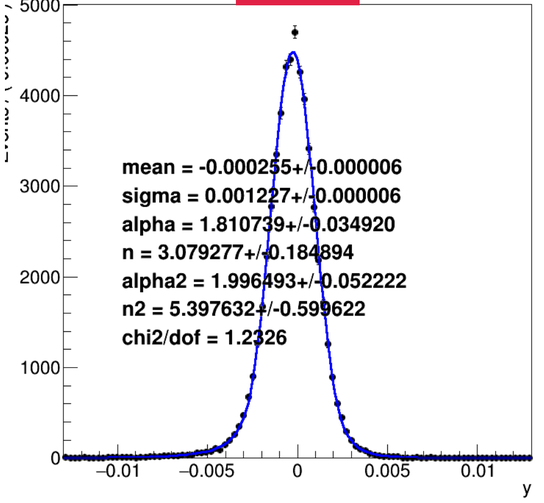

red; 1GeV




2GeV "y"

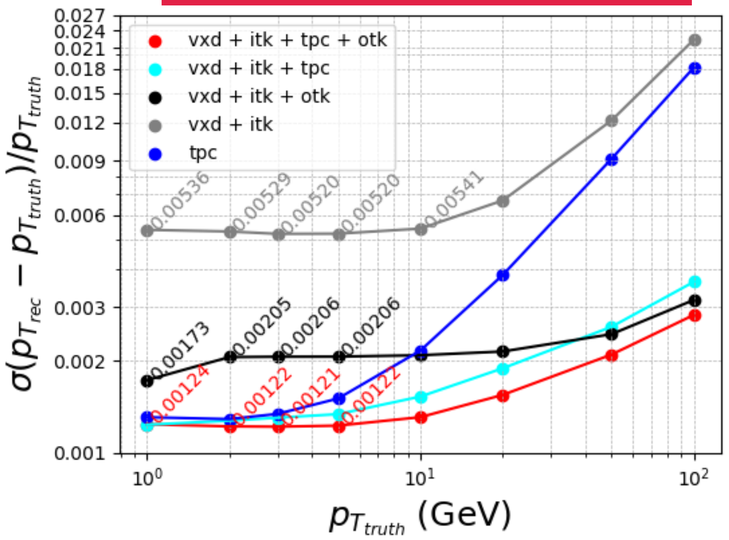



3GeV "y"

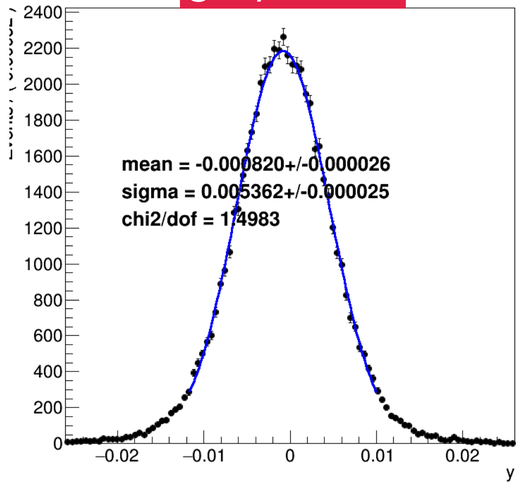


# Tracking Resolution with New MR198

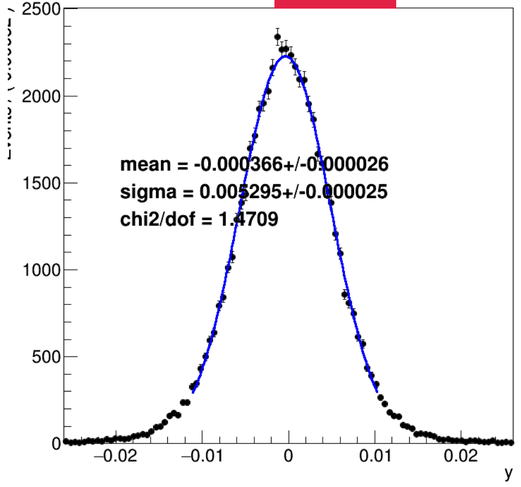
Gaussian; Subrange



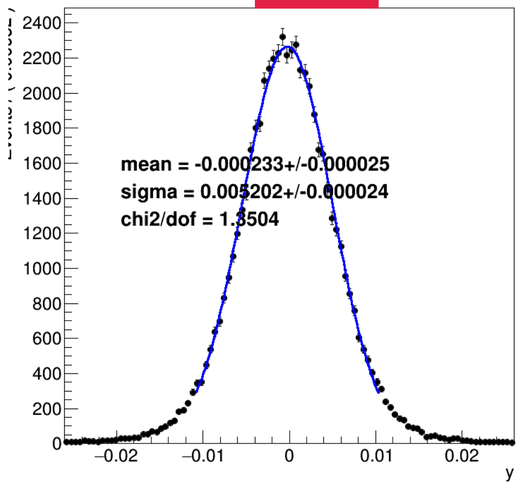

gray; 1GeV



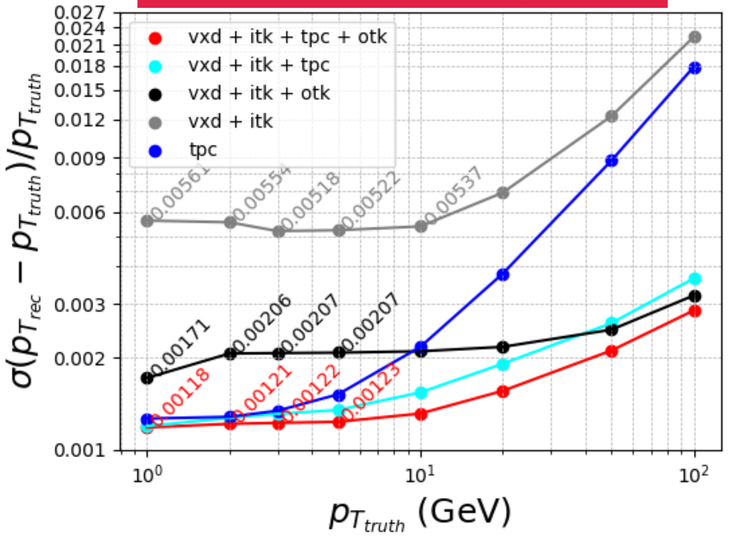

A Roof 2GeV



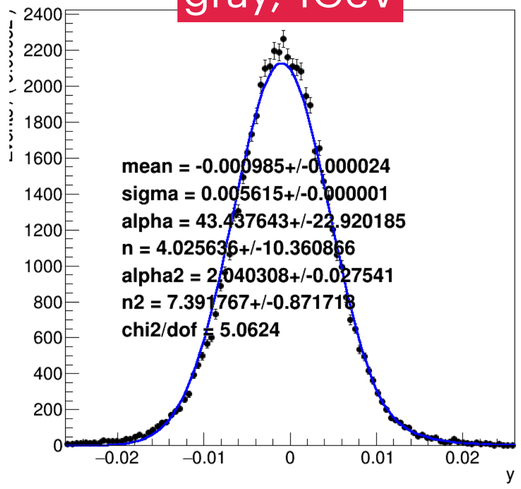

A Ro 3GeV



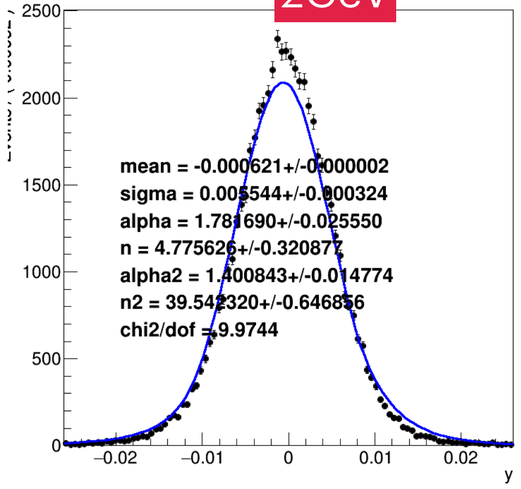

DSCB; Fullrange



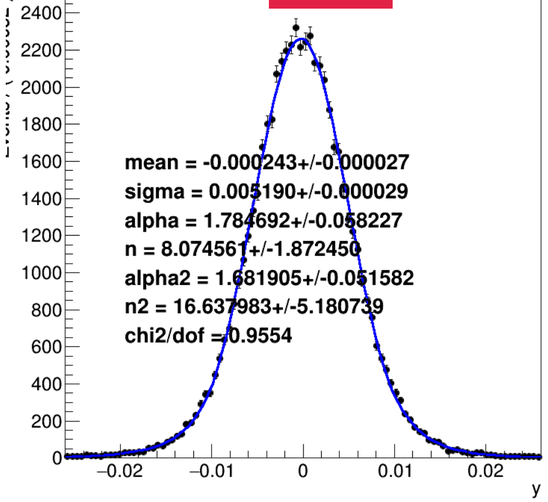

gray; 1GeV




A Roof 2GeV

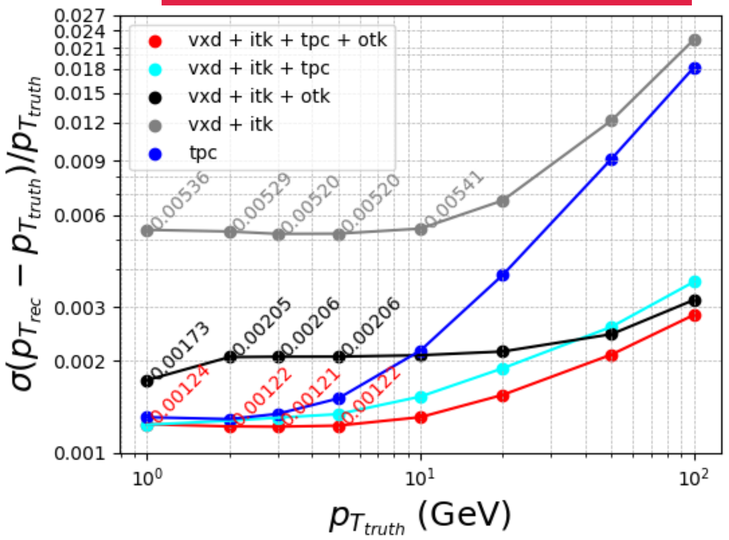



A Ro 3GeV

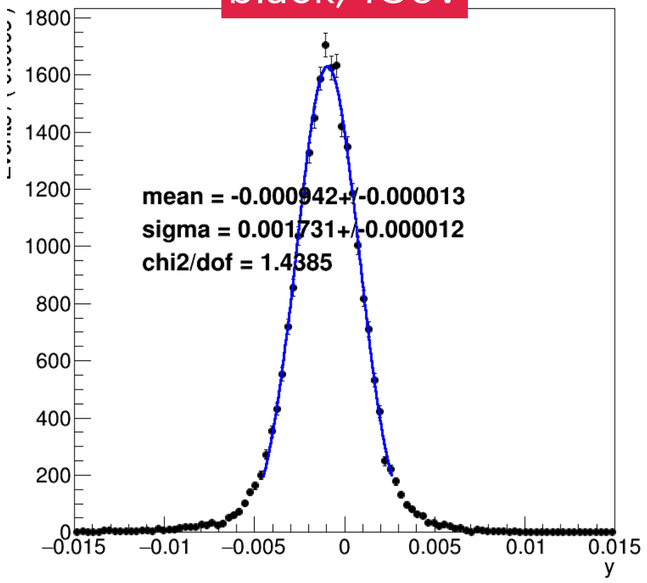


# Tracking Resolution with New MR198

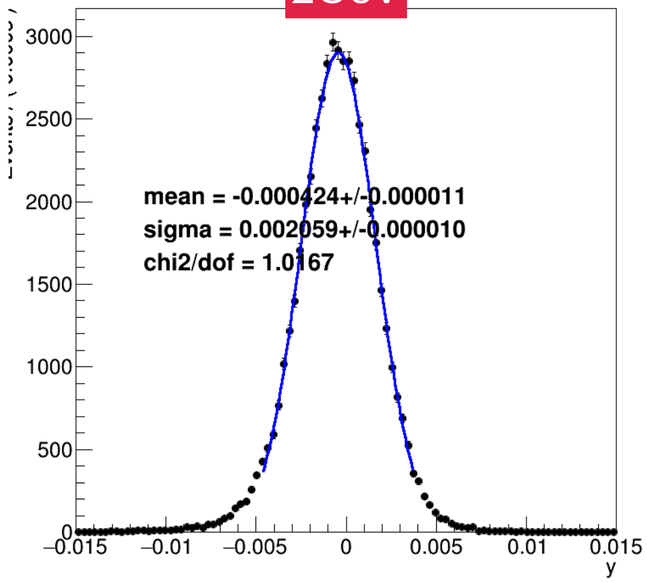
Gaussian; Subrange



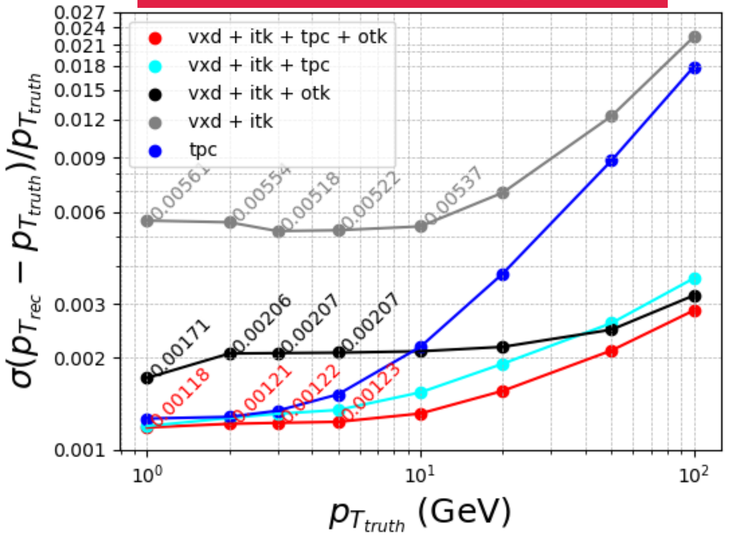

black; 1GeV



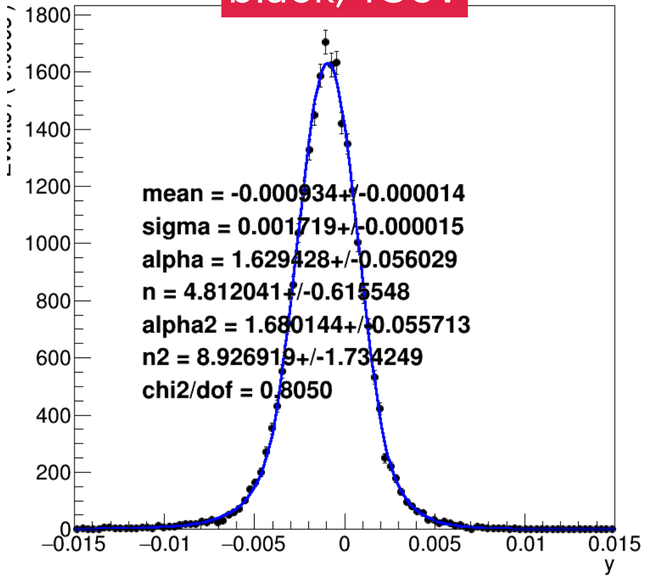

2GeV



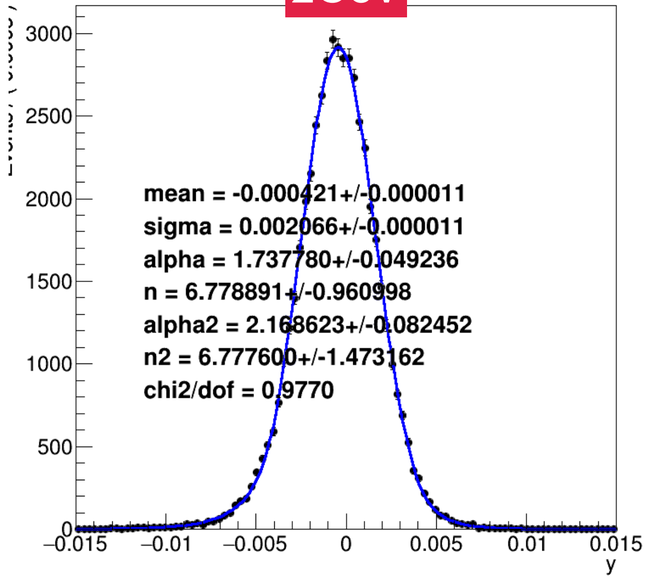

DSCB; Fullrange




black; 1GeV



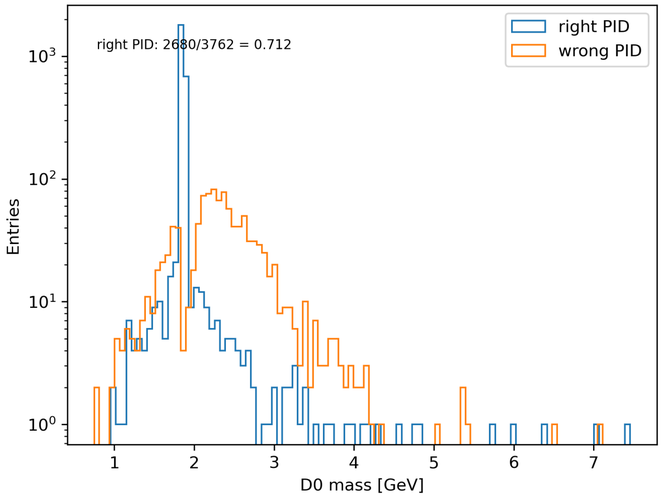

2GeV

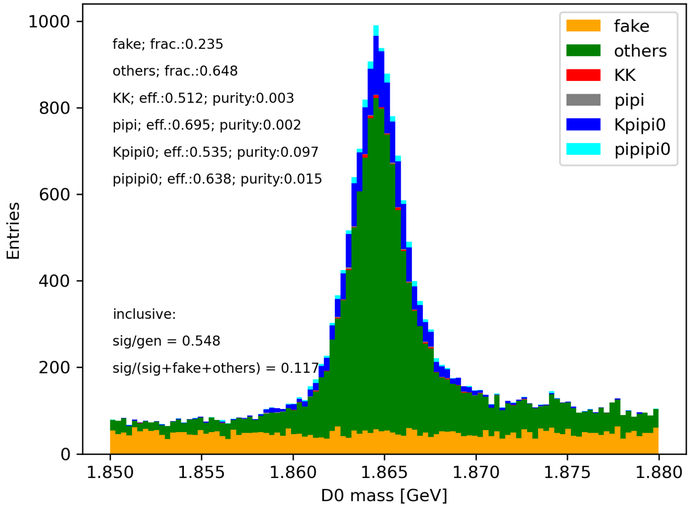


# $D_0$ reconstruction

- $D_0 \to \pi\pi\pi^0$

| | Global efficiency | Purity | |
|---|---|---|---|
| Events with two tracks reconstructed | 94 % | | |
| Vertex reconstructed | 87 % | | 7% tracks used by prim vtx |
| mass window | 64 % | 1.5% | 1.85-1.88GeV |
| charged pair | 64 % | 1.8% | |
| kinematic | 63 % | 1.8% | p1+p2 \dot vtx > 0 |
| chi2 | 58 % | 2 % | chi2(n=1)<4 |
| pi0 | 58 % | 12 % | truth |
| PID | 58 % | 91 % | TPC+TOF |




| Particle | Removed ratio (%) —— | ITKTOF |
|---|---|---|
| $K^-$ | 27.4 | 27.2 |
| $\pi^+$ | 13.1 | 13.0 |
| $\pi^0$ | | 18.0 |
| $K^-, \pi^+, \pi^0$ | 48.1 | 48.3 |

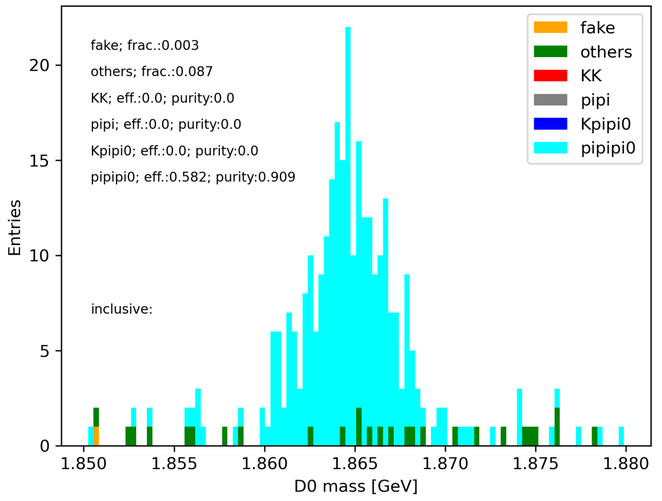



表: 各粒子的 PID（或重建）效率对样本的影响