Truth Vertexing at CEPC

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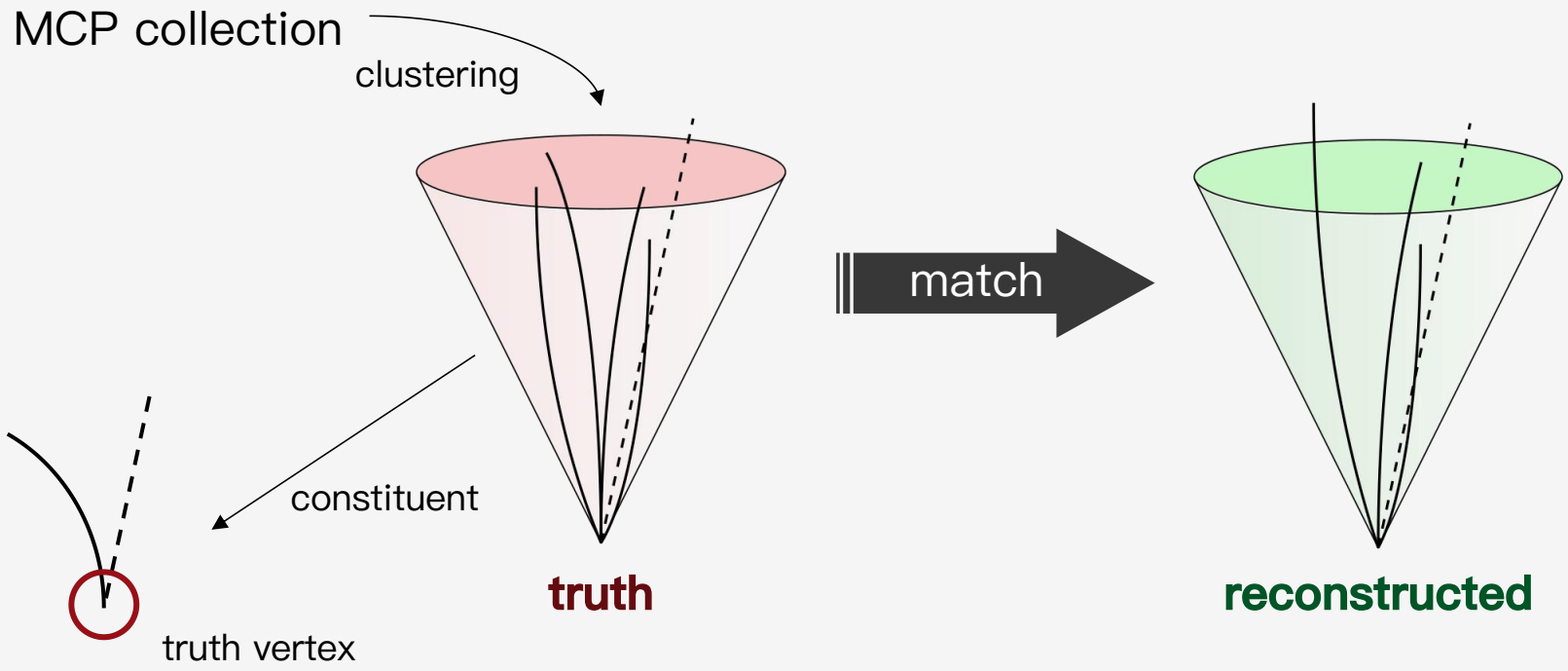
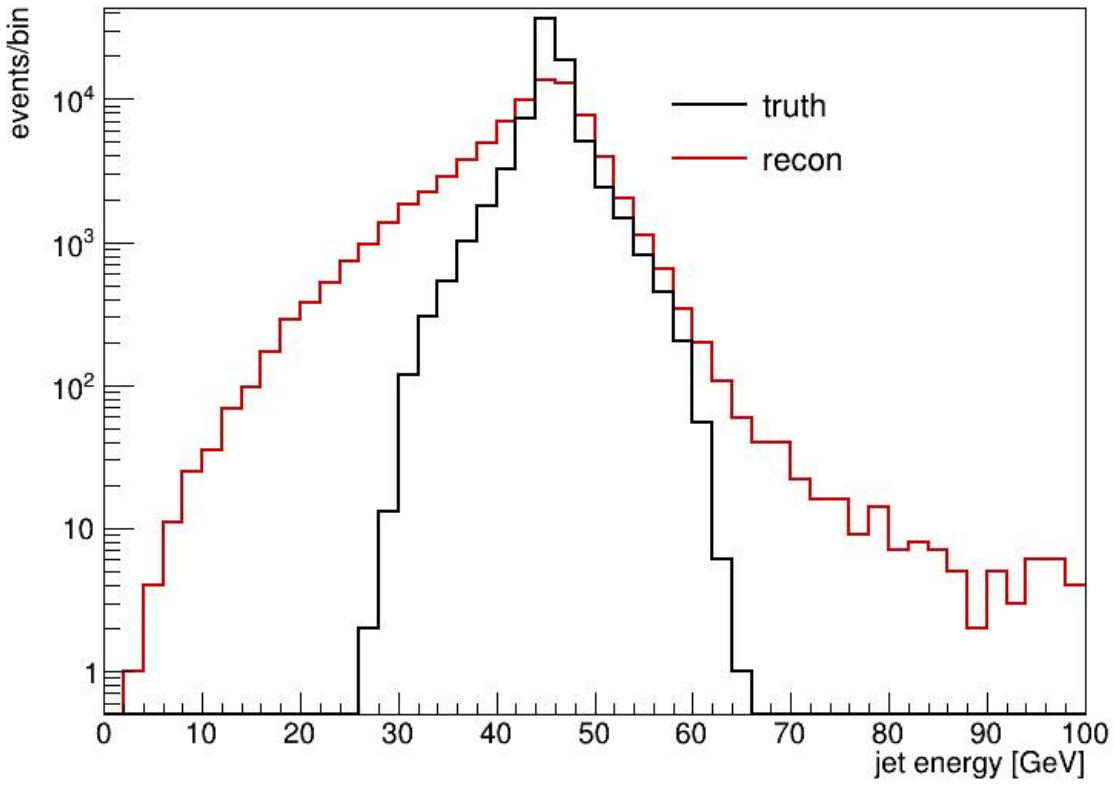
Truth matching idea

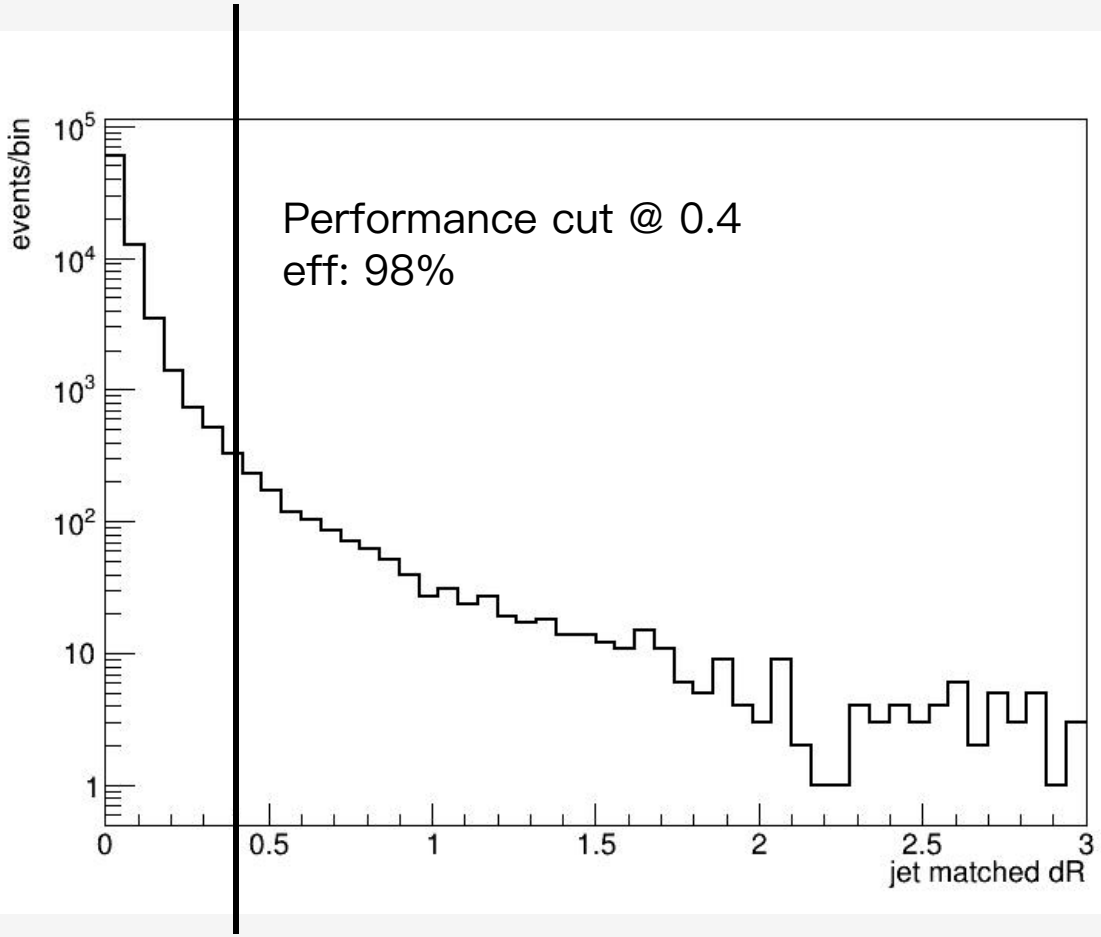
- Jet
  - Reconstructed: clustered PFOs
  - Truth: clustered MCP (charged + neutral & stable)
- Vertex
  - Reconstructed: tracks (charged PFO)
  - Truth: vertex of charged stable MCP



Jet matching performance

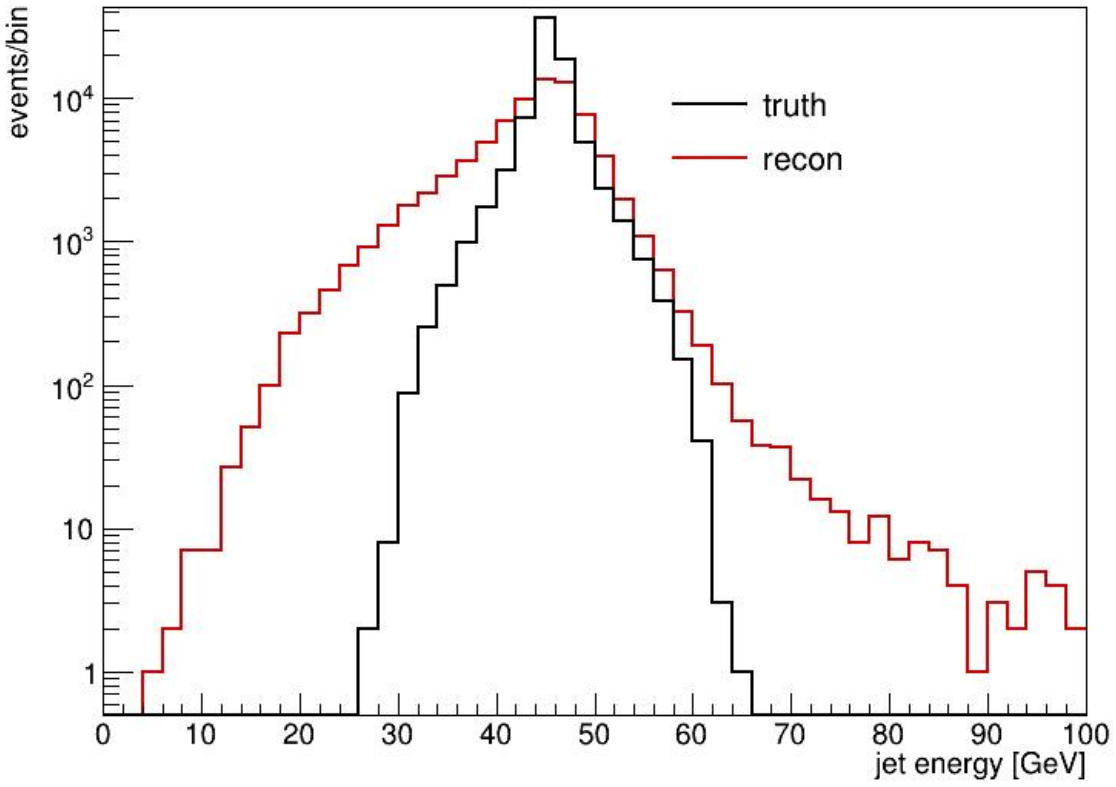
- ee->bb @ 91.2GeV
- Match jet by ΔR

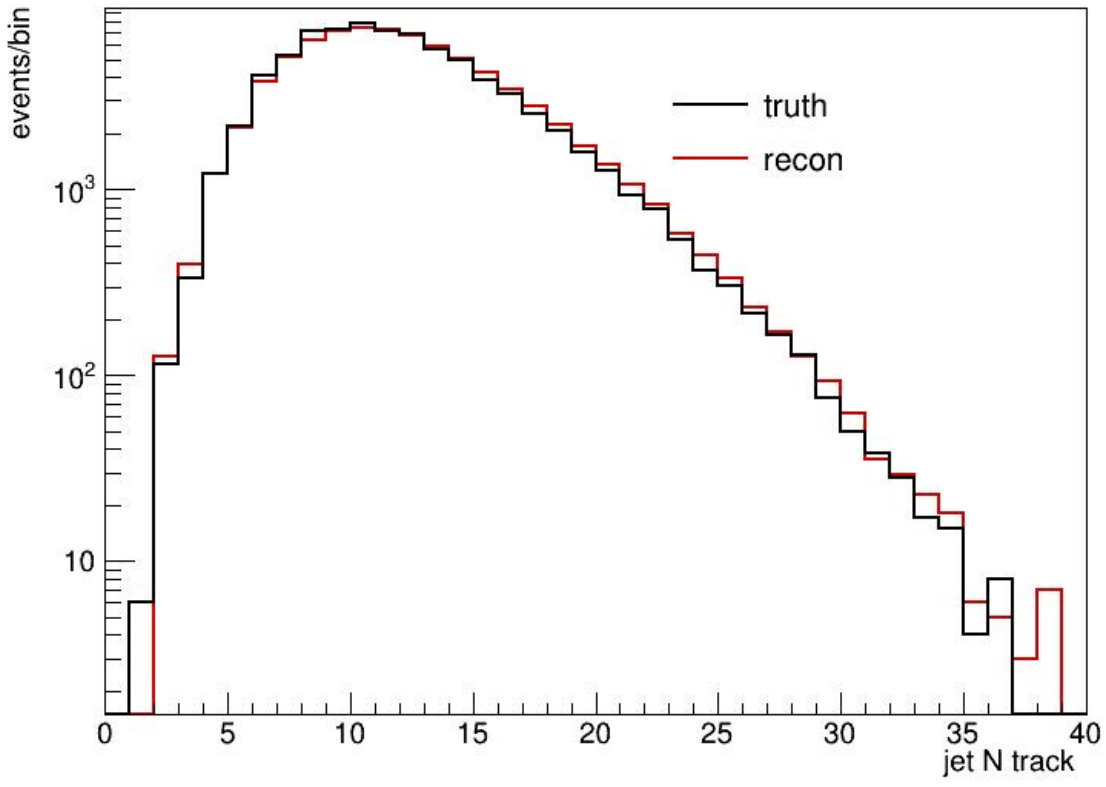




Jet vars

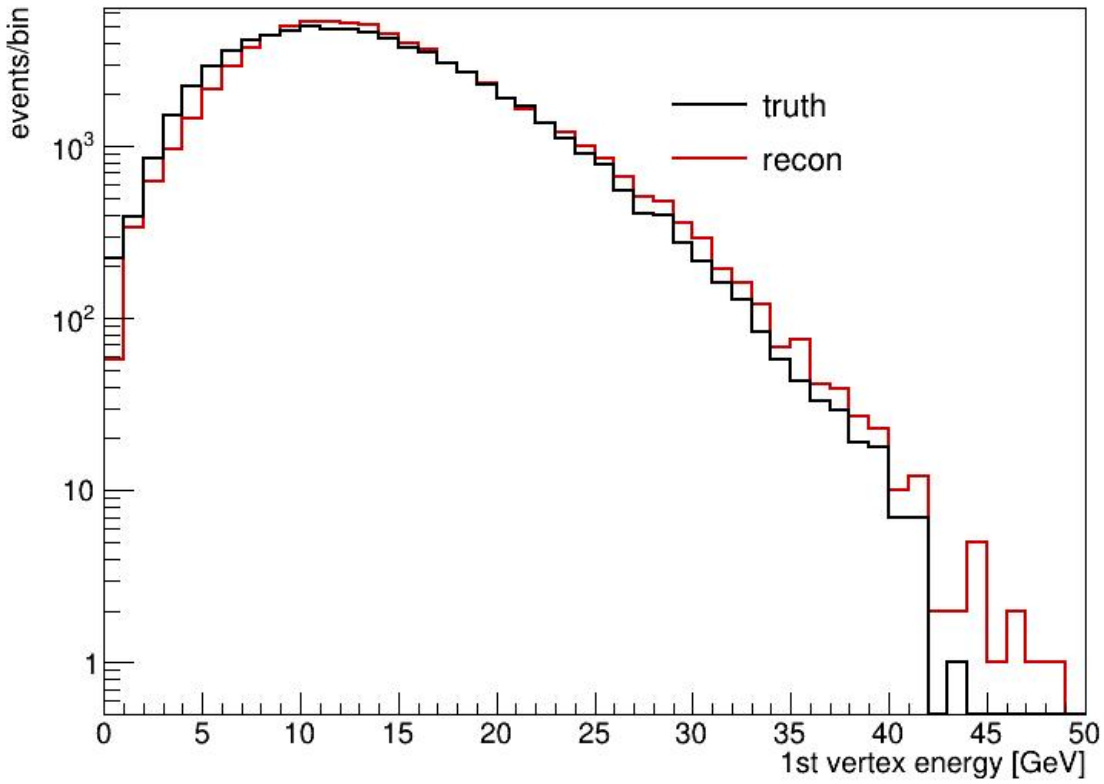
- ΔR < 0.4
- Energy resolution: ~9%
- Charged track counts match well

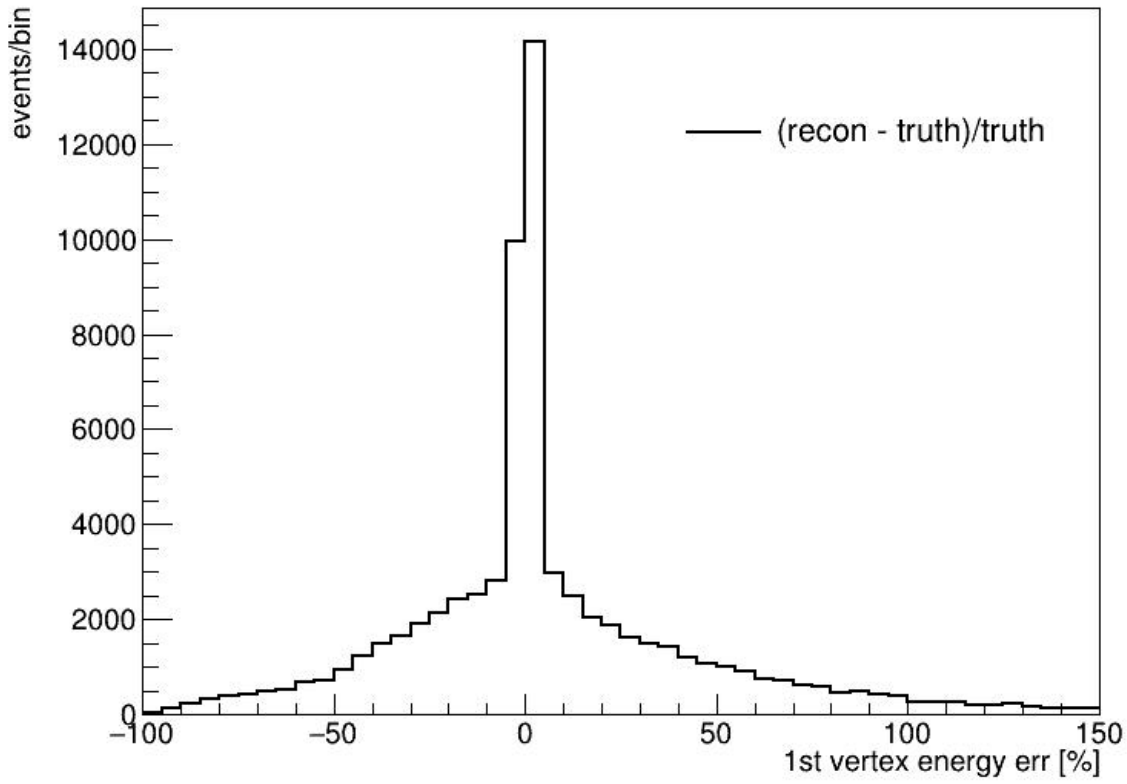




First secondary vertex vars

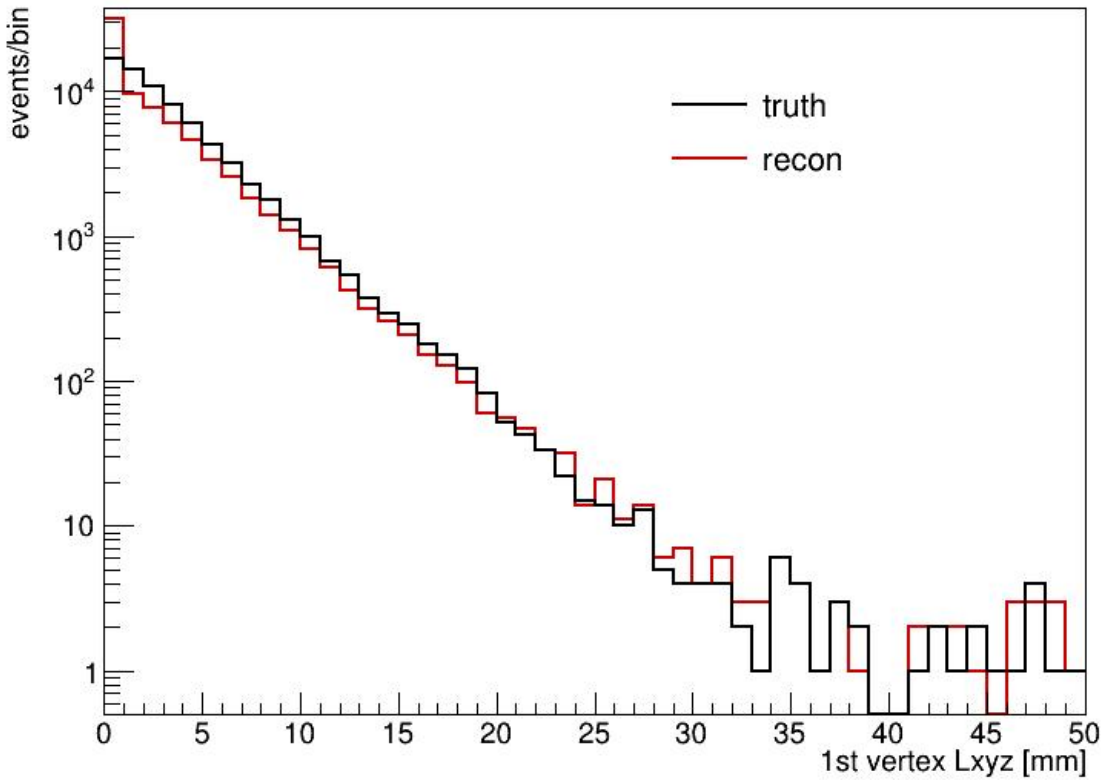
- Match reco/truth vertex with highest energy
- Select matched vertices with distance(rec, truth) < 20mm
- ~3% shift from reconstructed vertices

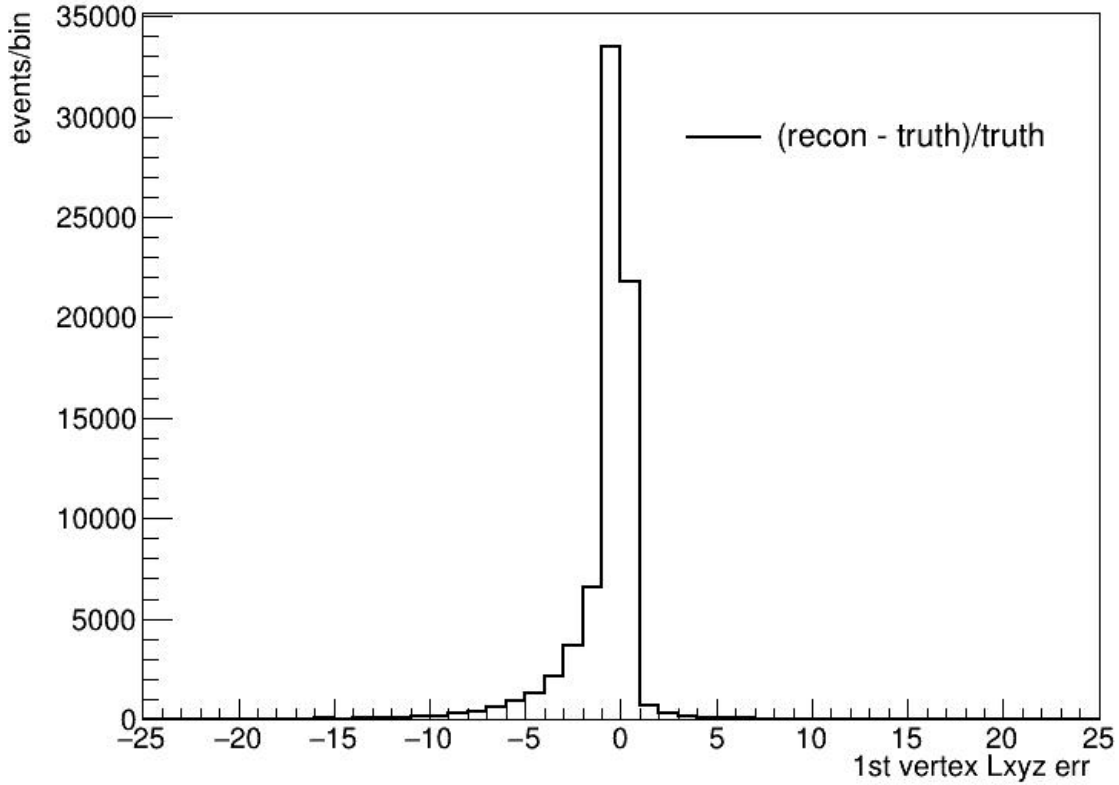




First secondary vertex vars

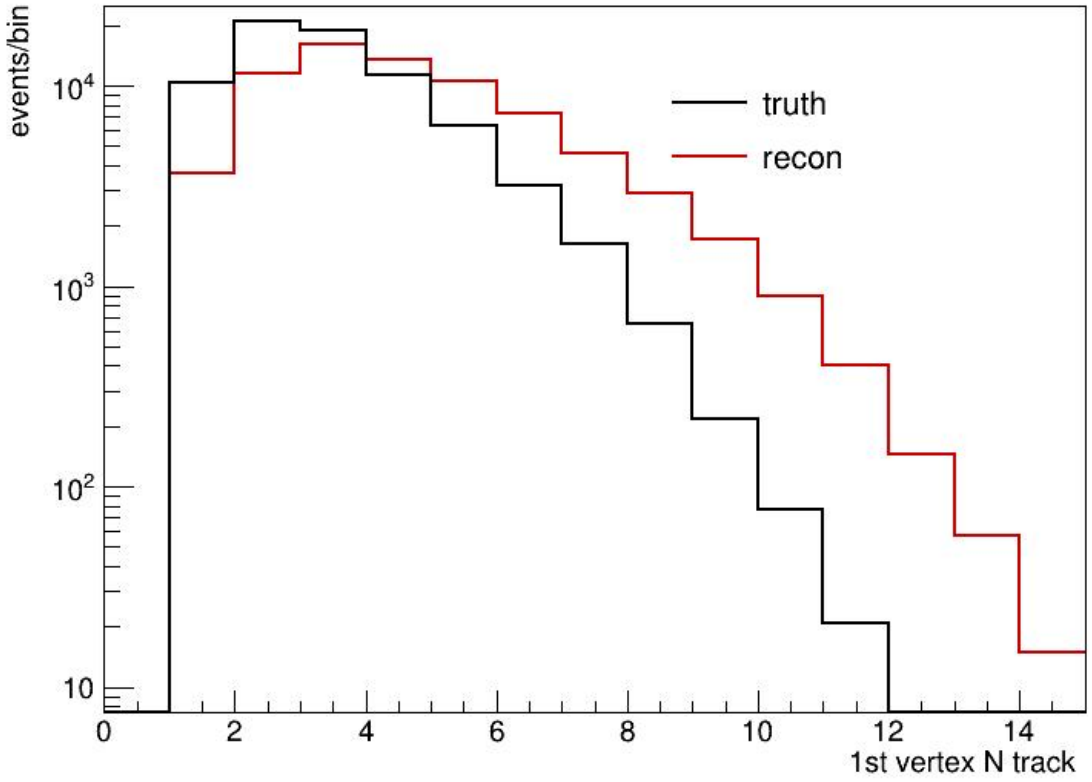
- Vertex distance to IP
- More reco vertices close to IP

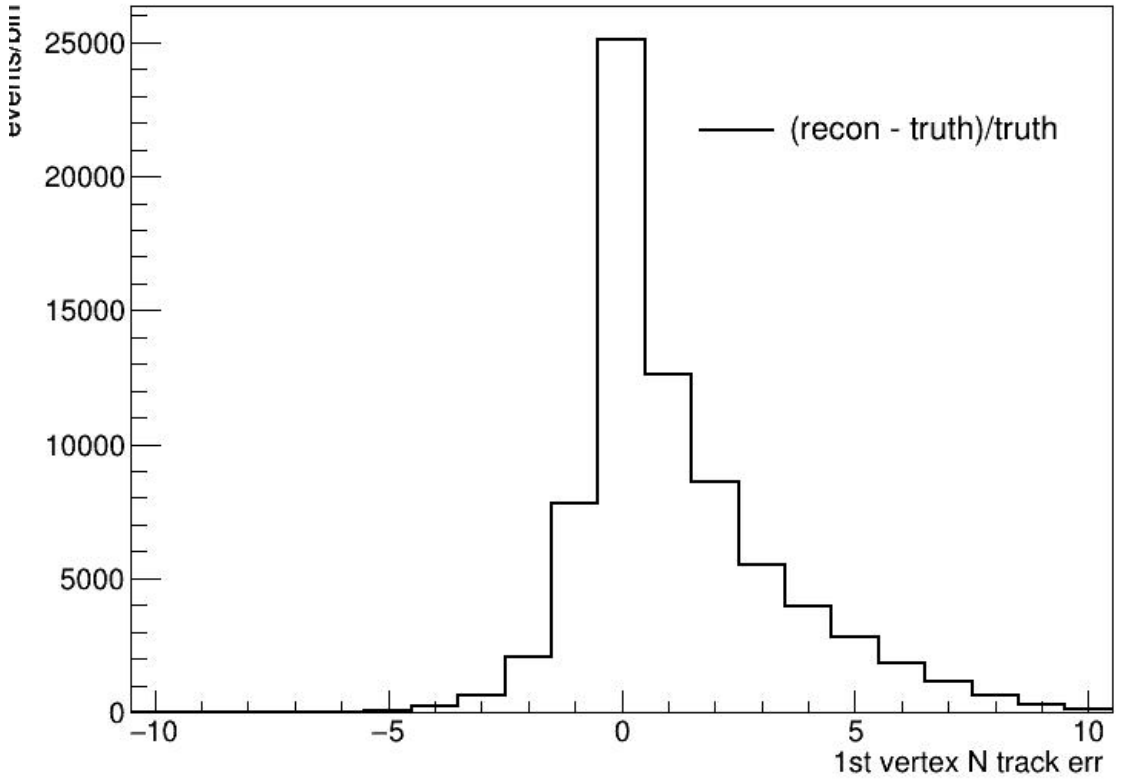




First secondary vertex vars

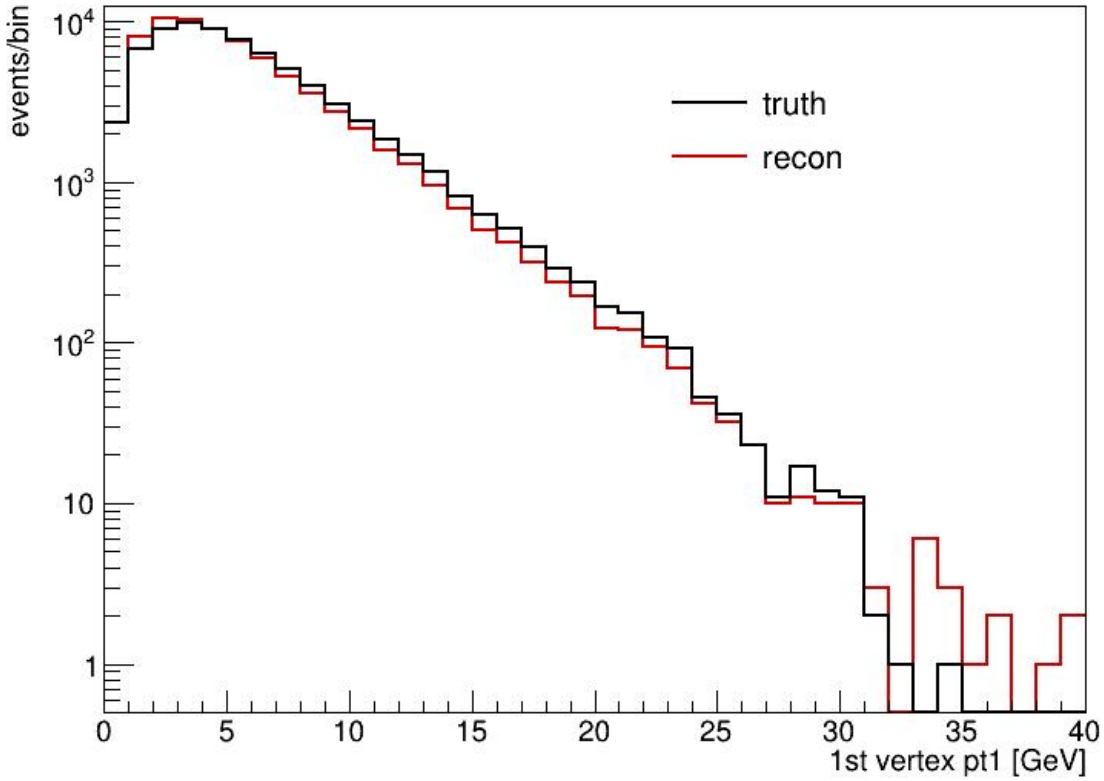
- Vertex N tracks
- Reco vertex tend to have ~1 more track

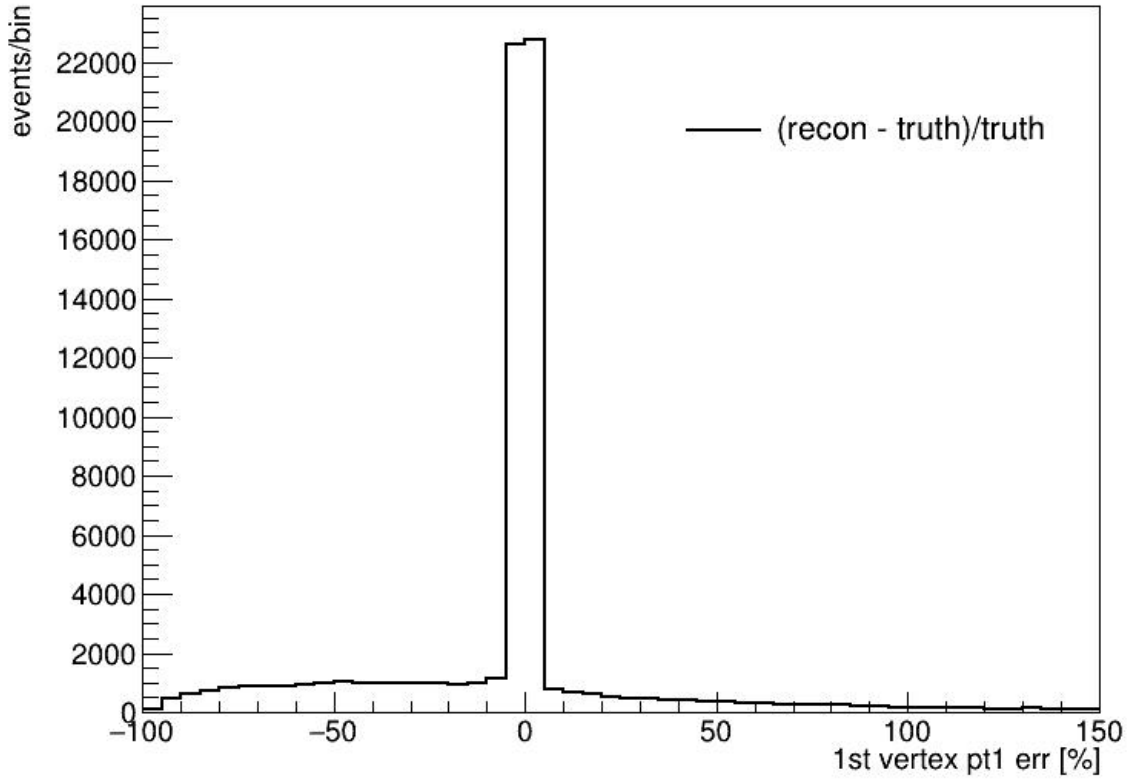




First secondary vertex vars

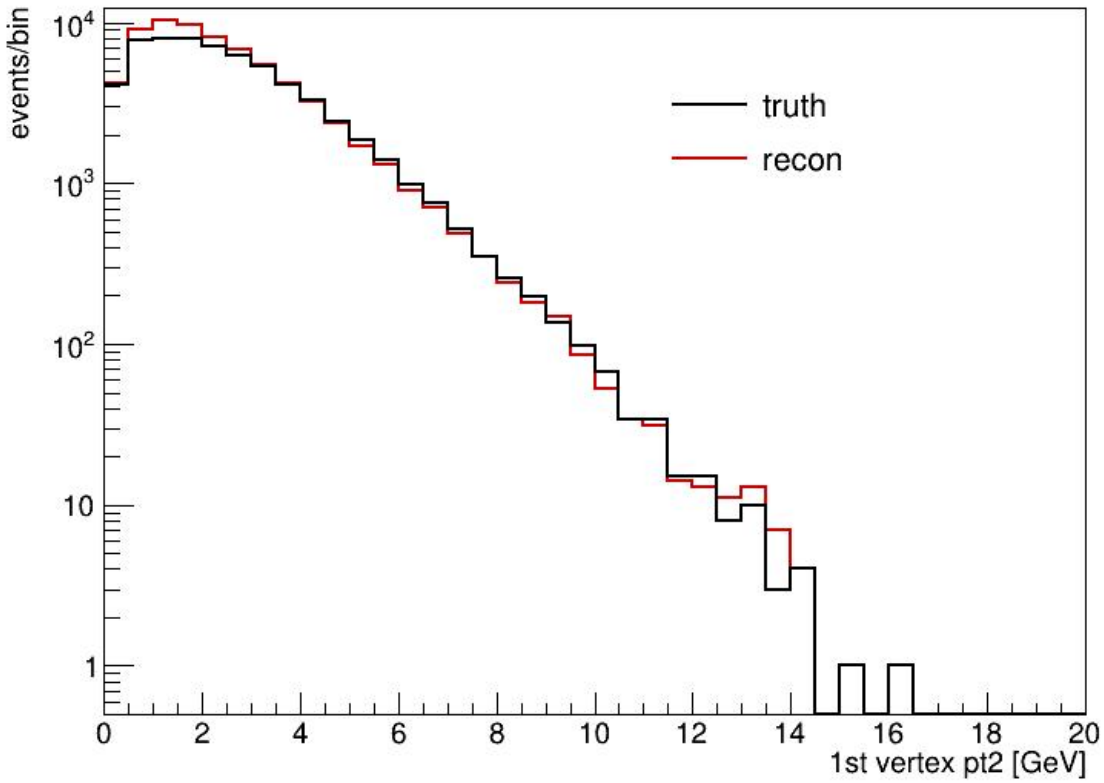
- Leading pT of the hardest vertex
- Select vertices with distance(rec, truth) < 20mm
- Good agreement

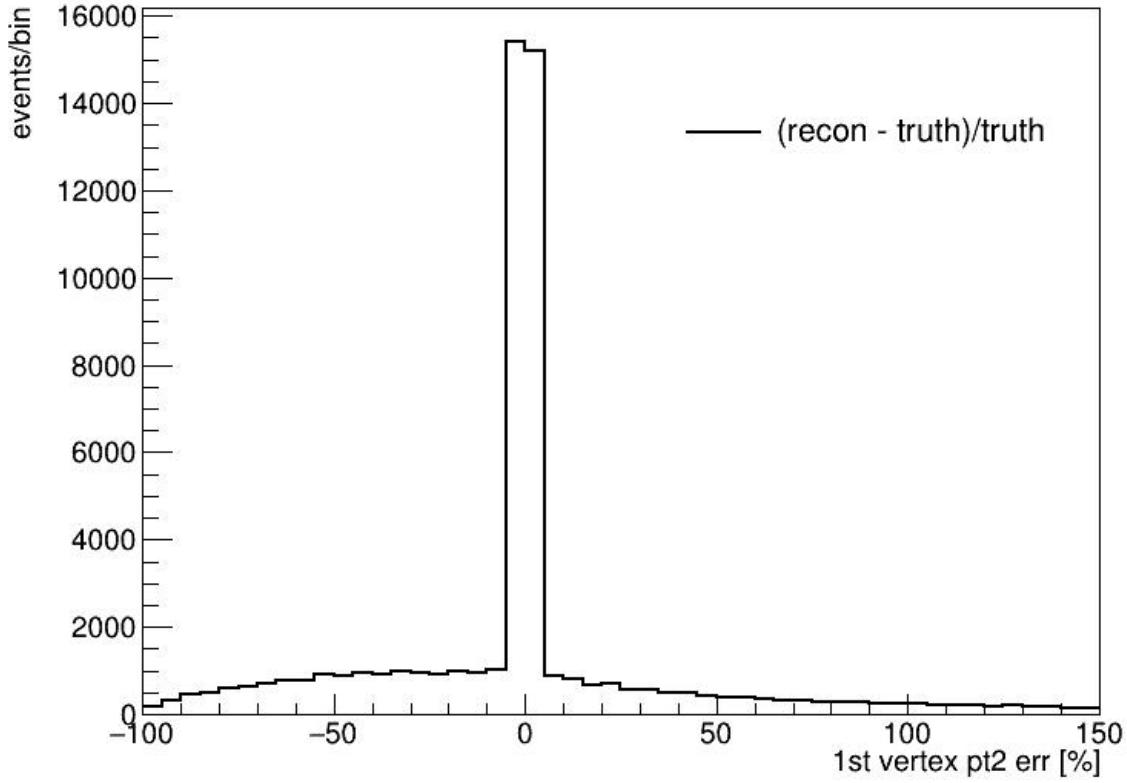




First secondary vertex vars

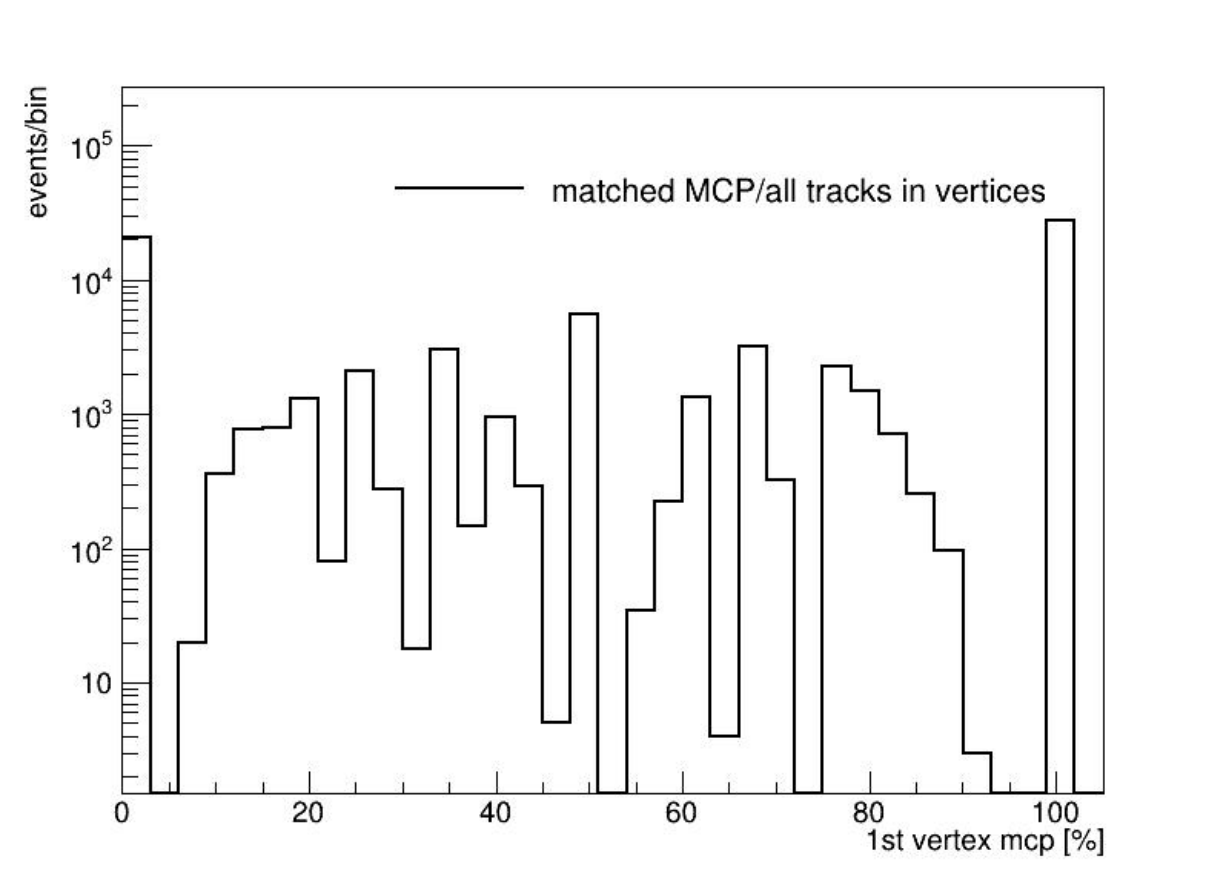
- Sub-leading pT of the hardest vertex
- Select vertices with distance(rec, truth) < 20mm
- Good agreement





First secondary vertex vars

- Ratio of tracks from reco vertex matched to correct MCP in the truth vertex
  - Ratio = (tracks matched to correct MCP)/all tracks
- No tracks in hardest reco vertices matched to MCPs from truth: ~28%



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Thank You

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