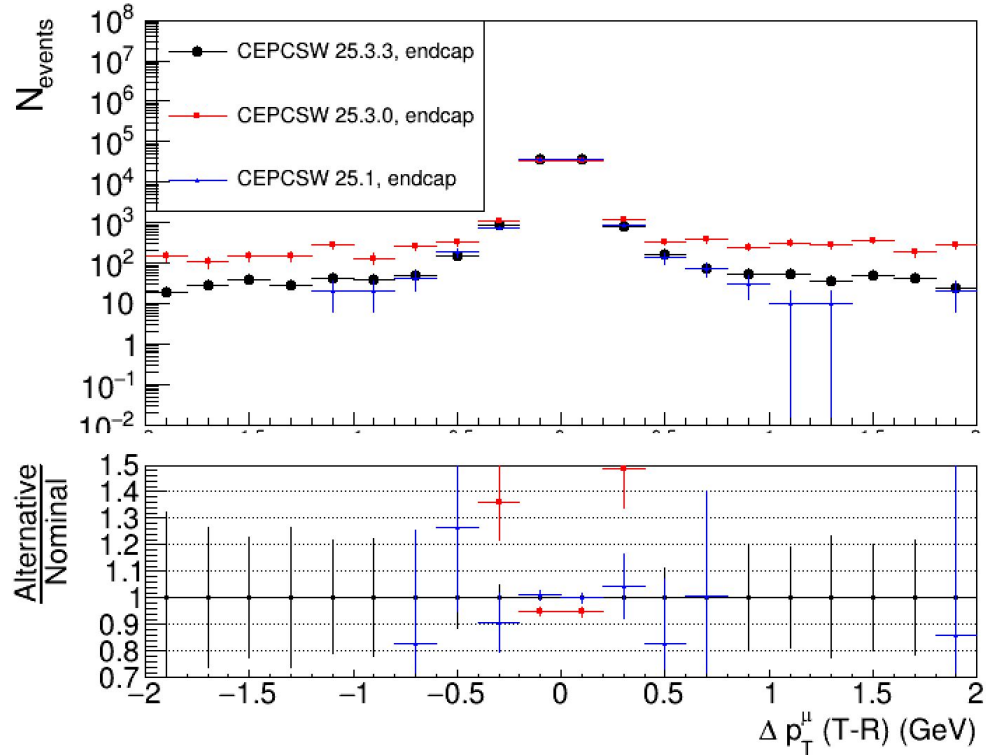# 25.3.3 vs 25.3.0 vs 25.1

- 91.2 GeV, Z->mumu, truth mached
  - The 2 truth muons match to exactly 2 opposite charge PFO (dR < 0.05), PFO pT > 1 GeV, cos(theta) < 0.99, PFO charge = Truth charge
- Plot: delta_pT = Truth muon pT - Matched PFO pT
- The problem of large delta_pT at endcap is solved in 25.3.3

Analysis strategy and Cutflow (by JiaWei)

- Truth-level selection for a pair of opposite charge muon from Z
- Truth match to exactly 2 PFO (dR<0.05)
  - PFO pT > 1 GeV and cos(theta) < 0.99, PFO charge = Truth charge
- Selection in a ±10 GeV Z mass window
- Count for mu- theta > 0 or < 0

CEPCSW 25.3.3	91.2 GeV Z->mumu	Z->tautau	Z->bb	Z->cc
Total	198792	199838	89100	89550
Truth selection	198792	6044	5738	883
Match 2 PFO	195627 (98.4%)	5433 (2.7%)	2147 (2.4%)	423 (0.5%)
Z mass window	182620 (91.9%)	6 (0.003%)	0	0
costheta > 0	93409 (A=0.023±0.002)	1	0	0
costheta < 0	89211	5	0	0

Next Steps:

- Replace truth-matching with muon ID (under developments with 25.3)
- Move from counting to a fit on m(mumu)
- Understand why AFB=0.023±0.002 in MC (0.021 without Z mass window)
  - Different from expected value of 0.016-0.017, need to understand if it's reasonable a a problem in generation procedures
- Generate a larger sample for Z->mumu
  - Sample size of every 10^5 events: stdhep 120M, sim 24G, digi 3.5G, trk 5.5G, rec 5.5G, ntuple 60M, will firstly generate to up to 10^7 (stat error from MC is 3e-4)
- Define and implement beam energy spread and geometrical acceptance uncertainty