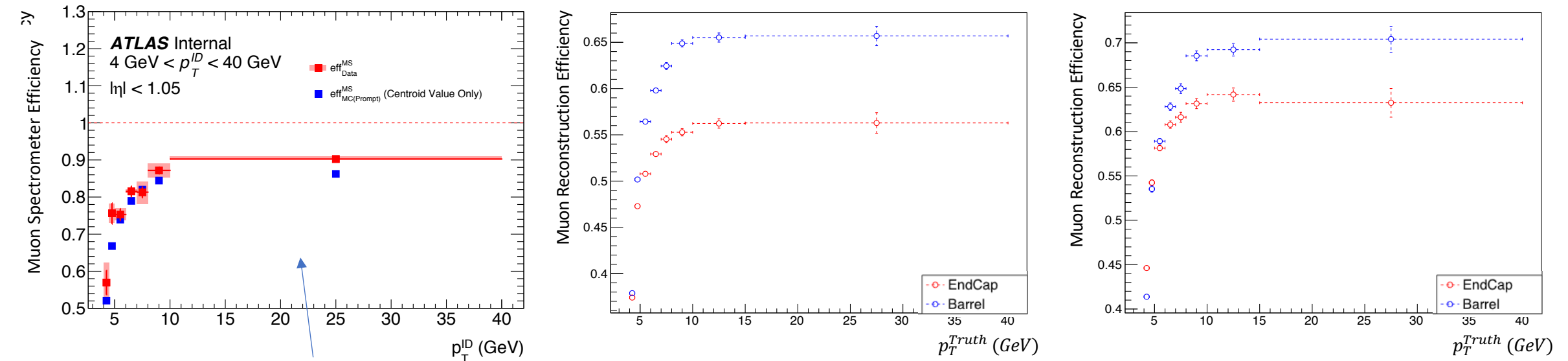


Tight Muon Reconstruction Efficiency

Xiaoning Wang (UIUC)

Summary

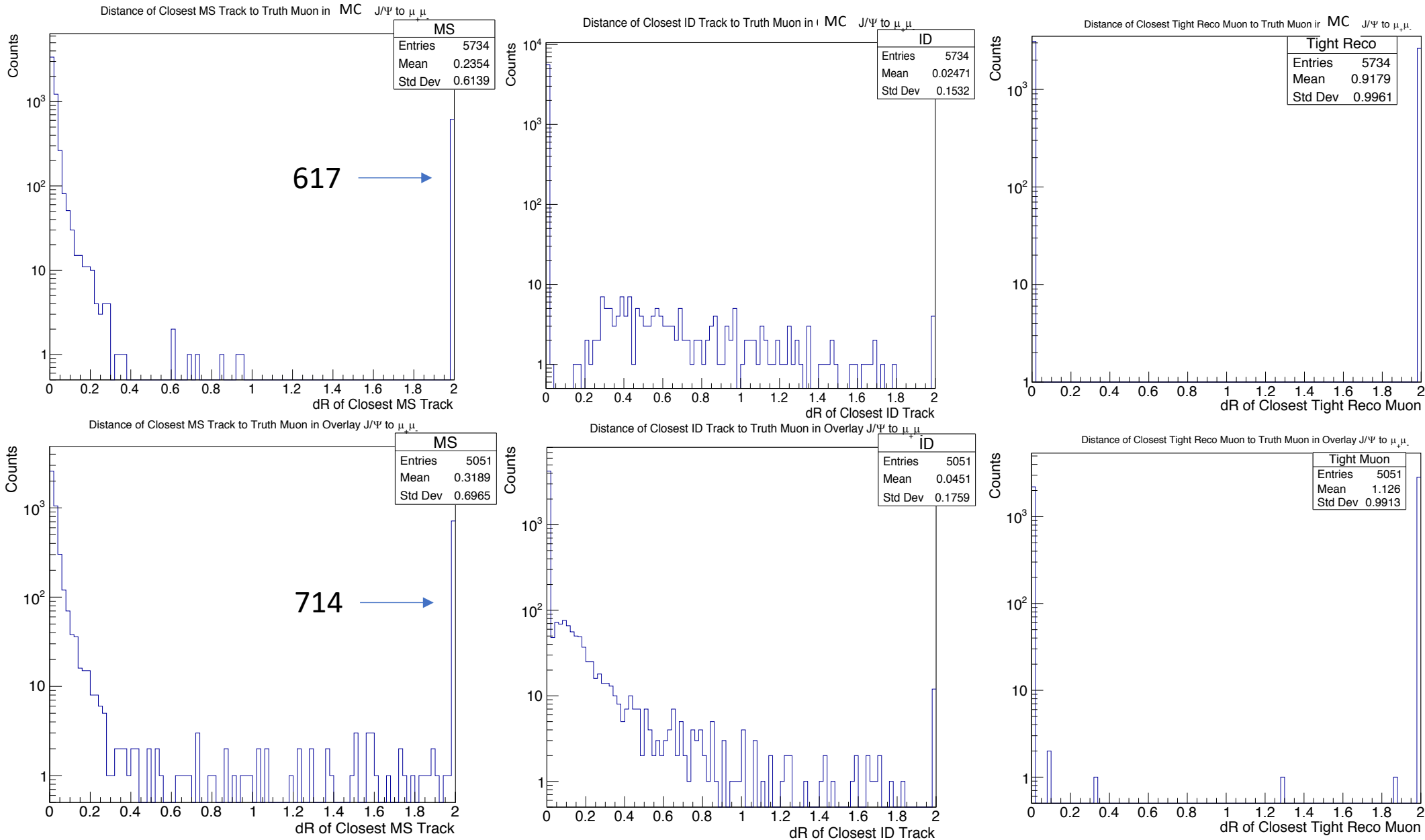
- Problem: Efficiency of tight muon construction differs by $\sim 20\%$ using "Tag and Probe" method.



Inner Detector efficiency calculated by T&P has a 90%-98% efficiency for all p_T^{MS} range, so the reconstruction efficiency follows approximately the same curve as MS efficiency.

- Plan: Look into what's missing in some events/where.
- Progress: tracks (ID & MS) that are close to truth muons are present, but some are not found in T&P method, thus missing some events with low reconstruction efficiency.
 - Lorentz vector summation method checked by hand, is correct.

Small samples of events (~ 5000), $p_T > 3.5$ GeV

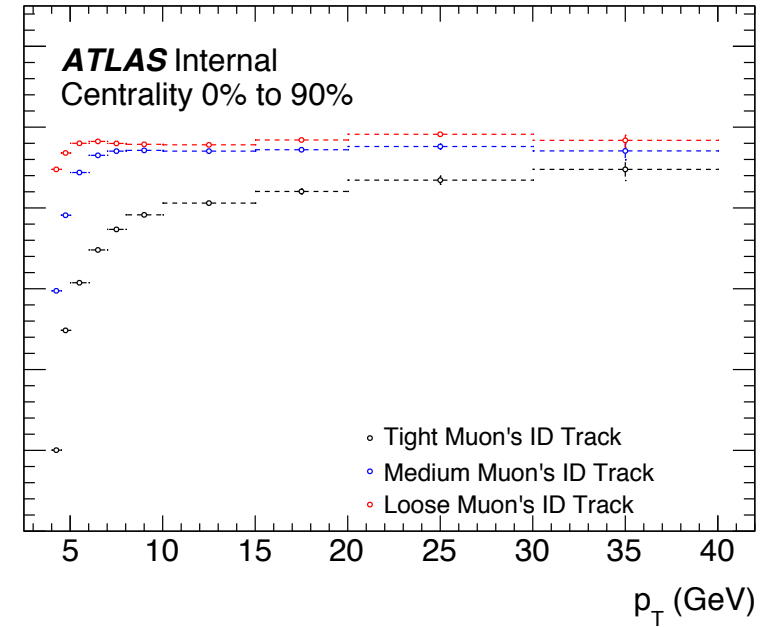
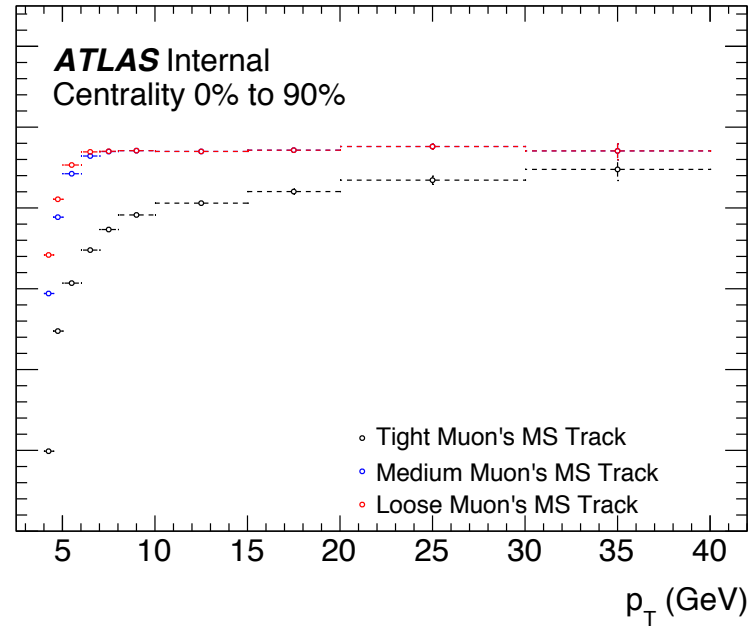
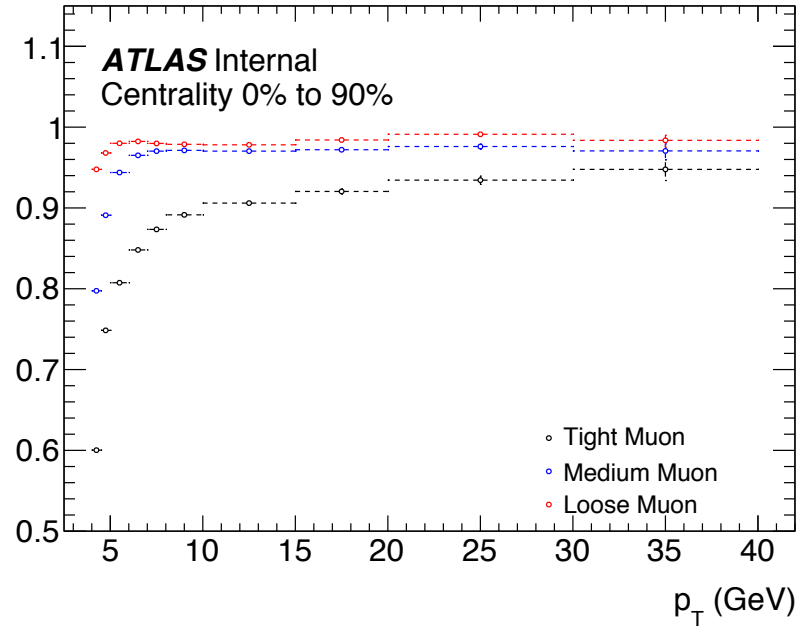


Row 1: MC
Row 2: MC overlay

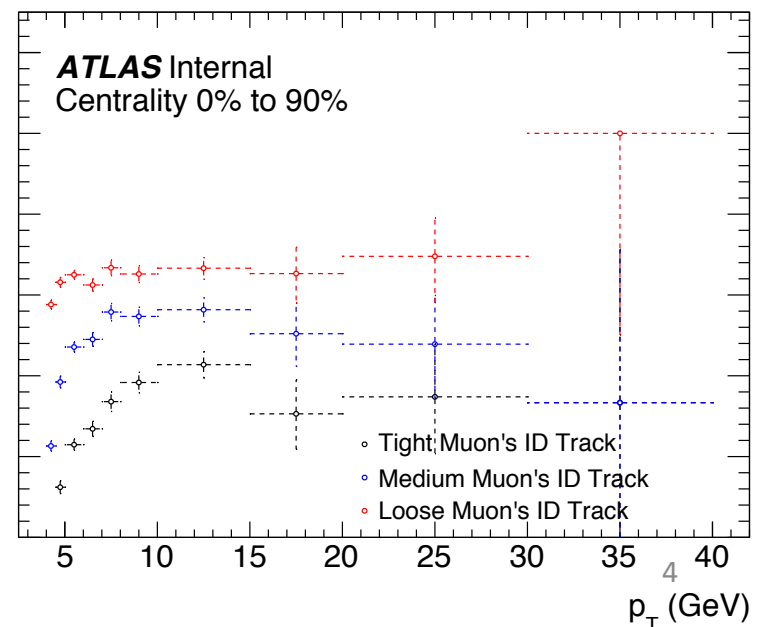
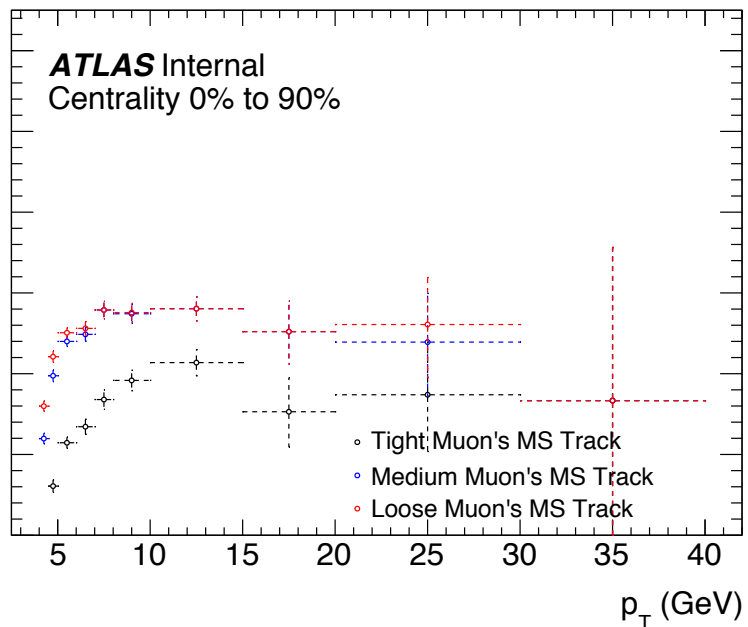
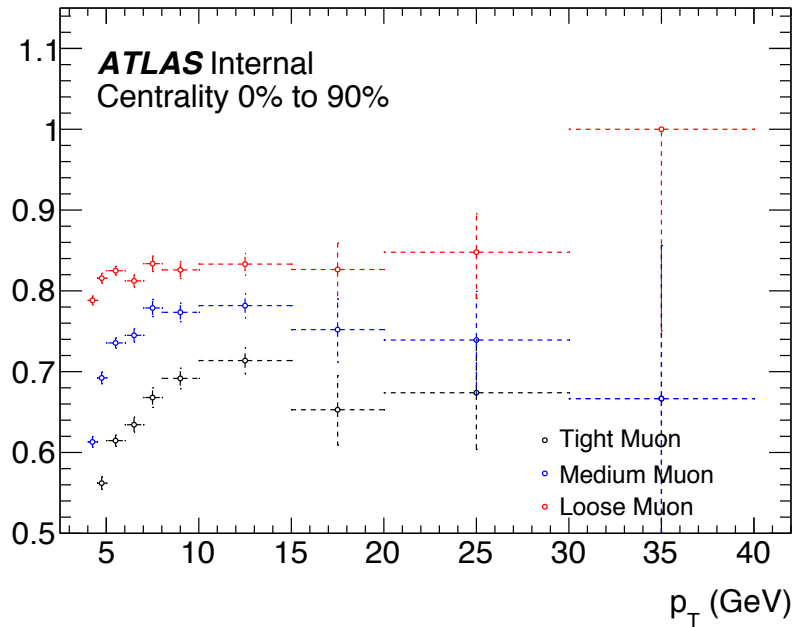
Reconstructed
tight muons are
mostly lost in
matching ID & MS
tracks in both pp
and overlay.

Tight, Medium and Loose Muon Efficiency in pp and PbPb ($\sim 30k$ events)

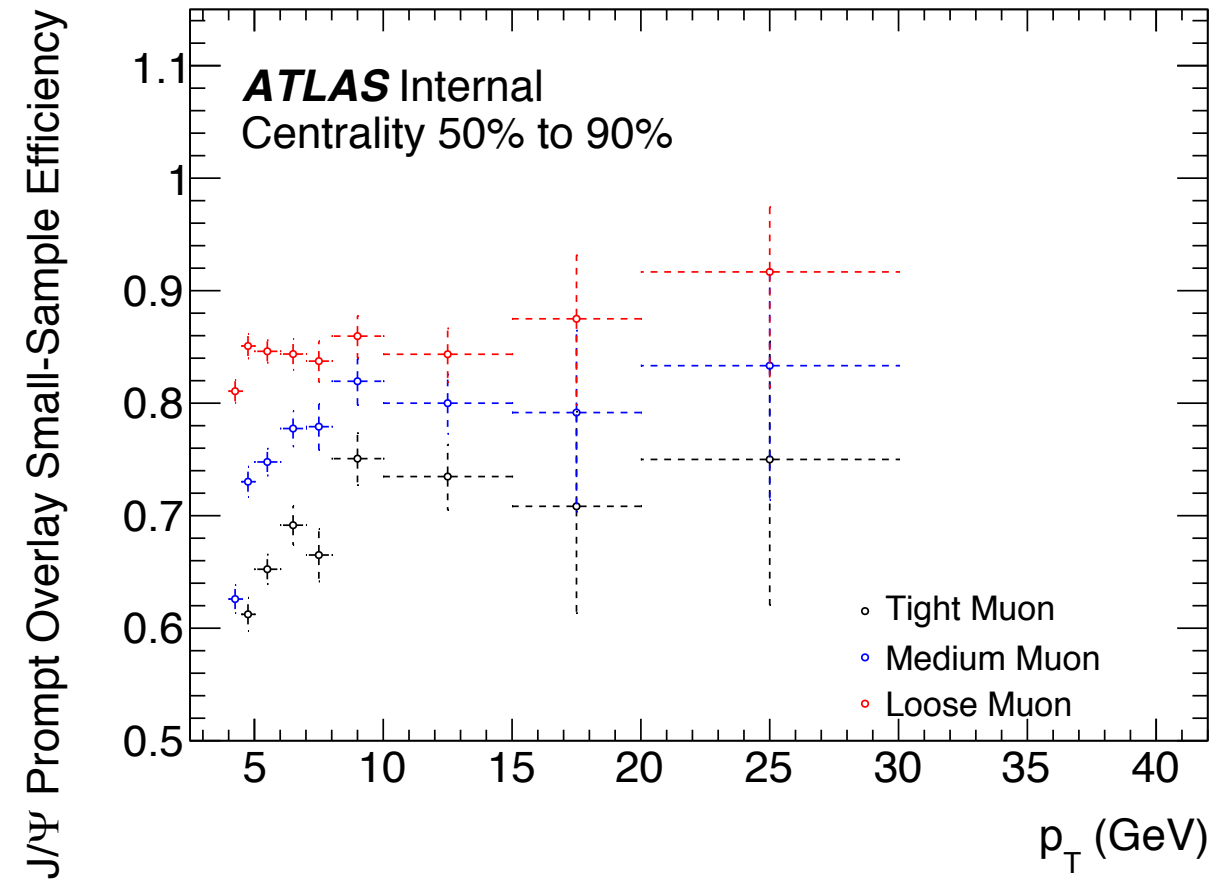
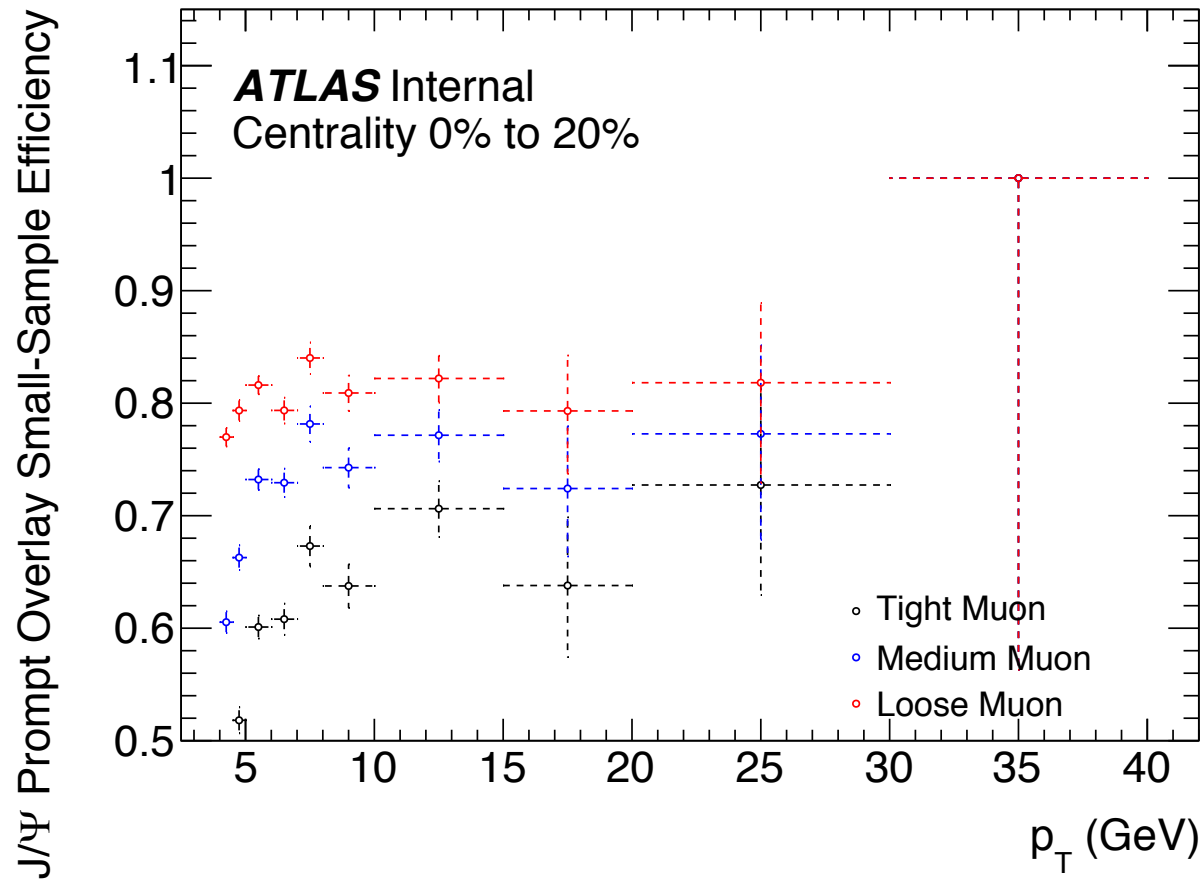
J/ Ψ Prompt Only Efficiency



J/ Ψ Prompt Overlay Small-Sample Efficiency

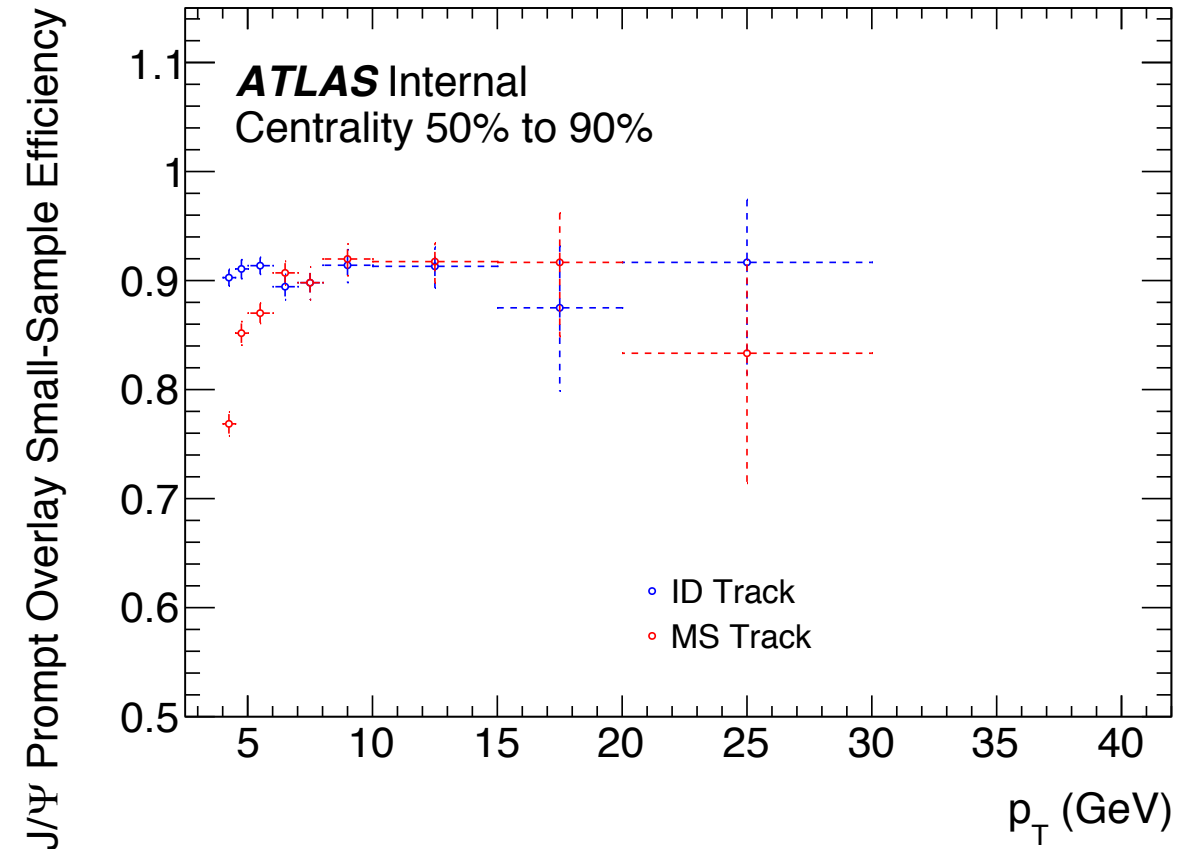
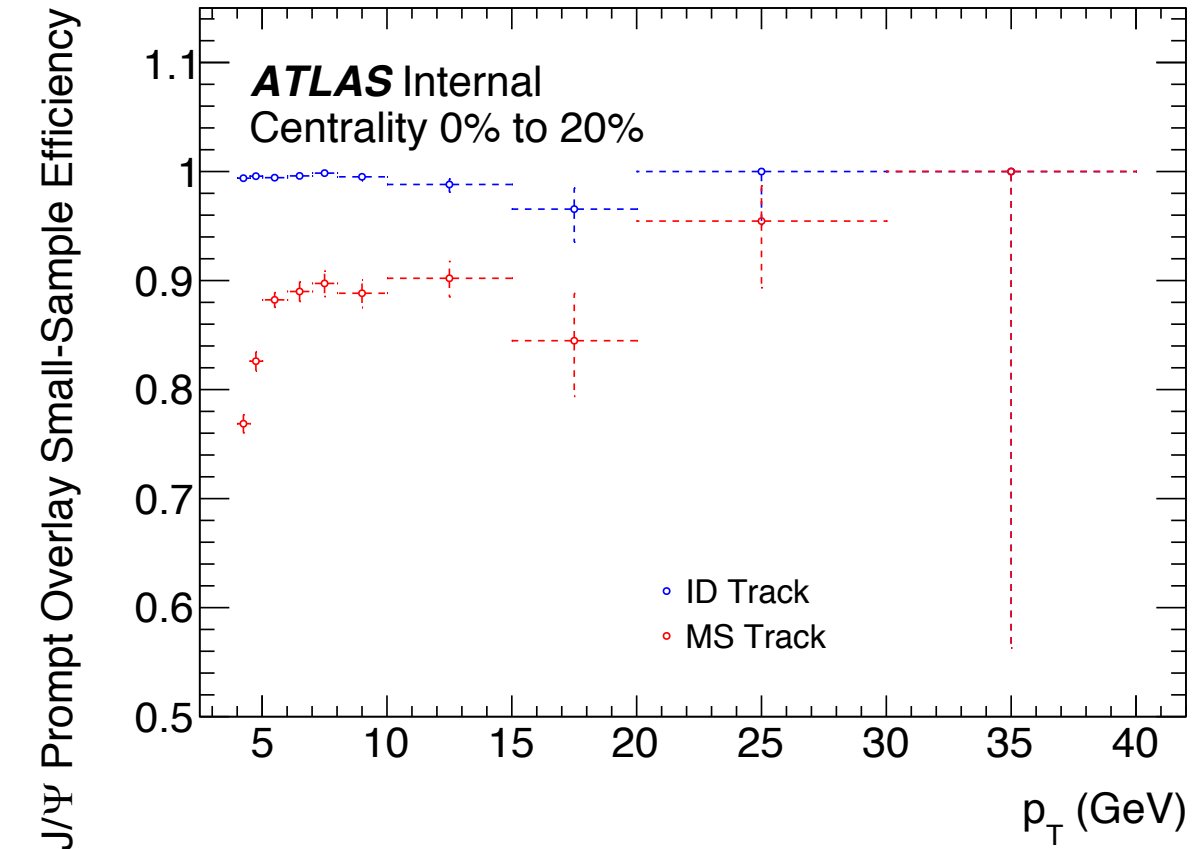


Tight, Medium and Loose Muon Efficiency in PbPb ($\sim 30k$ events) Central and Peripheral



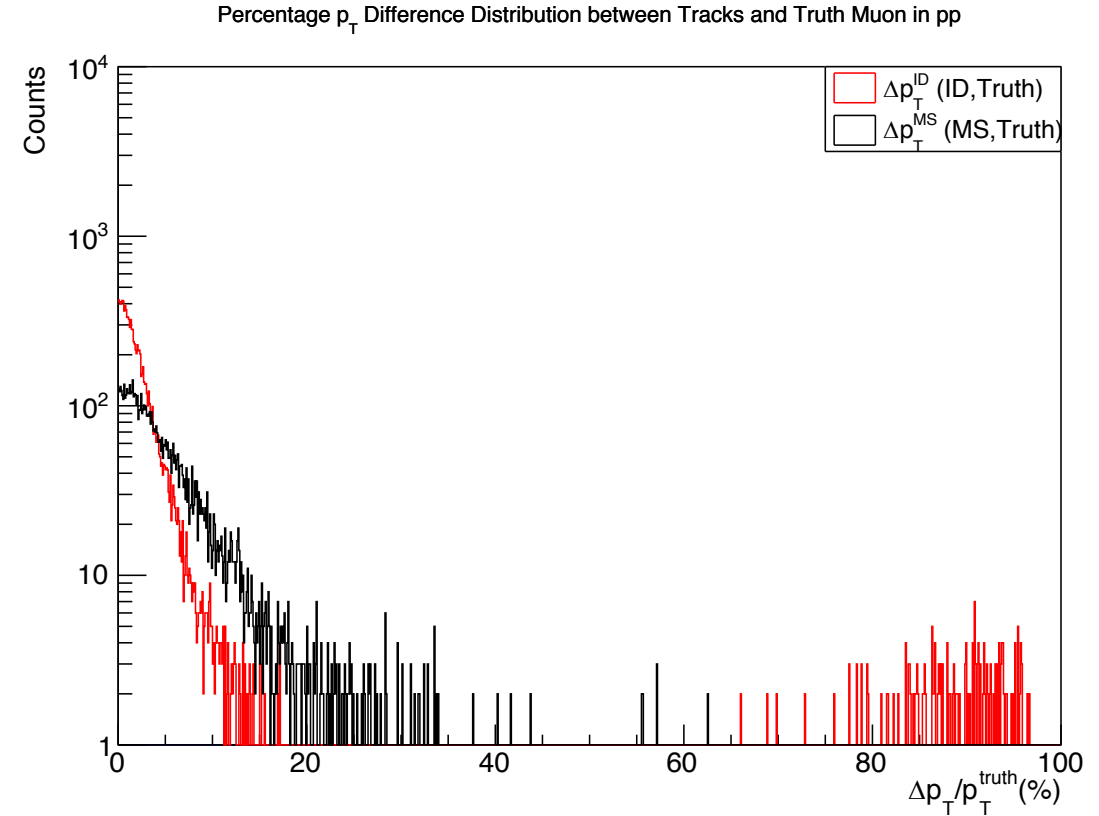
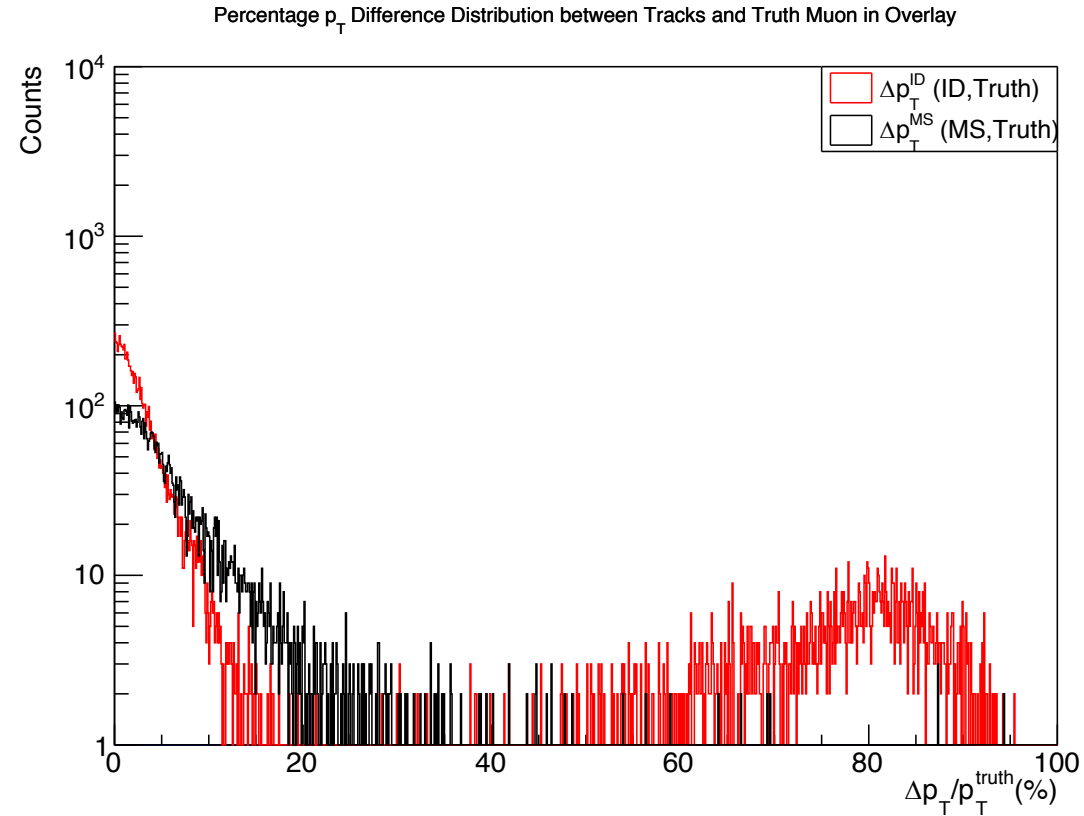
Peripheral Efficiencies are better than central by $\sim 5\%$.

ID Track & MS Track Efficiency in PbPb ($\sim 30k$ events)



Peripheral Efficiencies are worse than central by $\sim 10\%$.

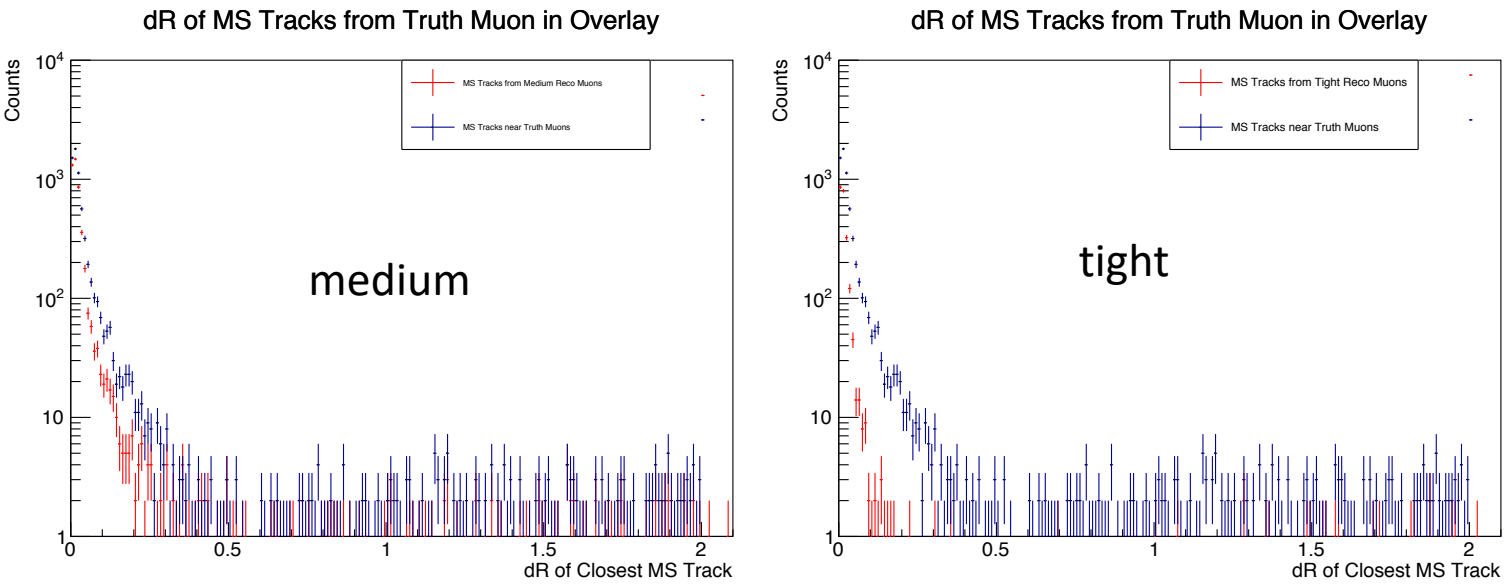
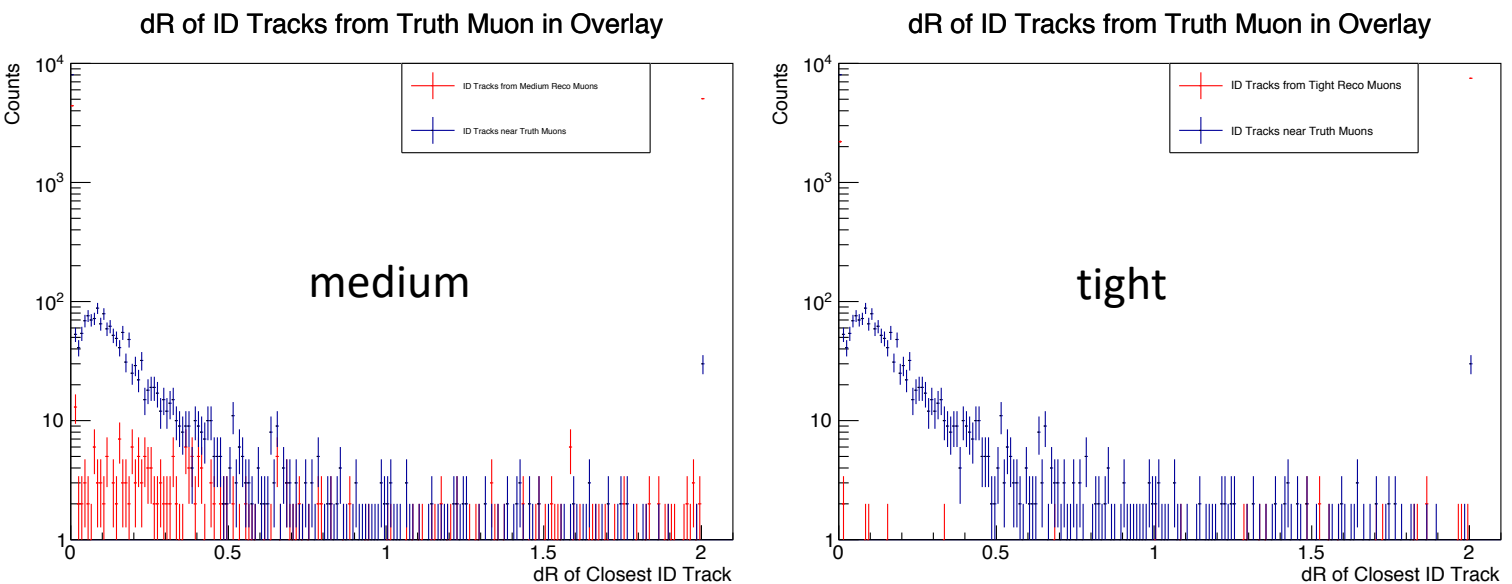
Tracks Reconstruction Efficiency for pp and Overlay



- More tracks with big p_T difference in overlay than pp.
- To-do: will check whether the effect is Fcal dependent or p_T dependent.

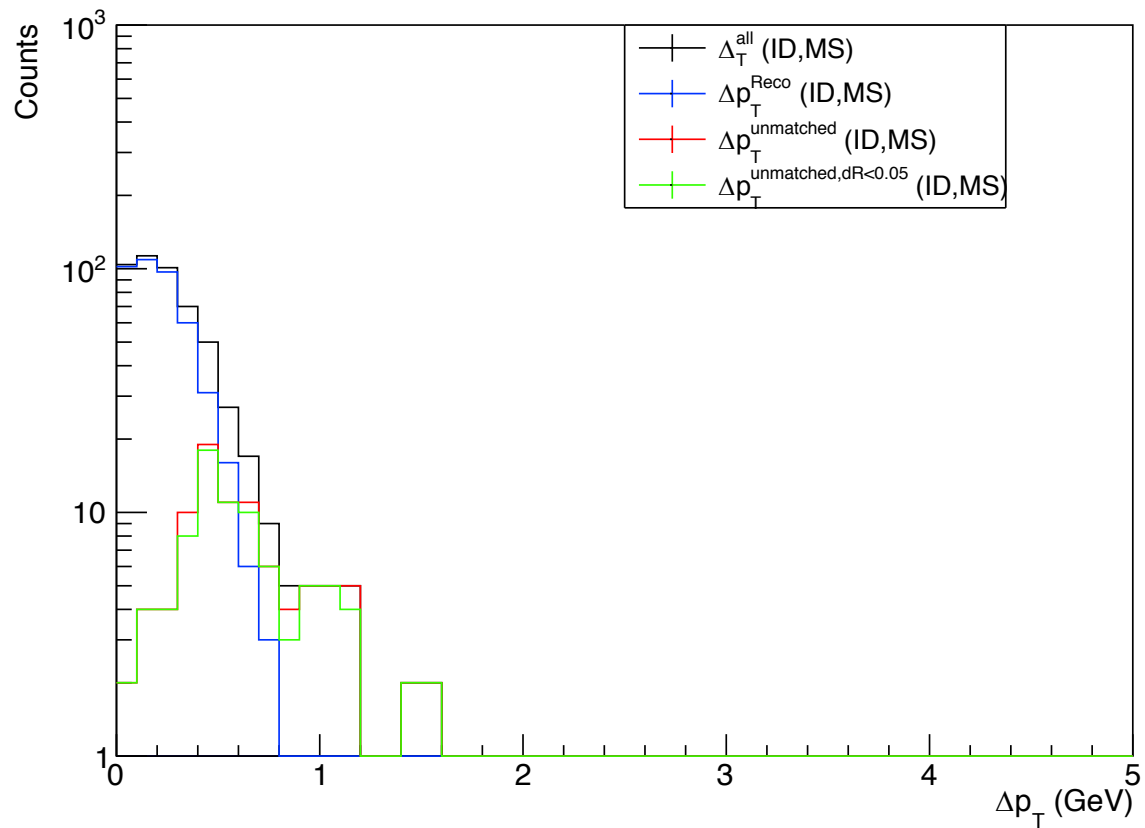
Back-Up

Comparison of Tracks those are used in Medium and Tight Reco Muons

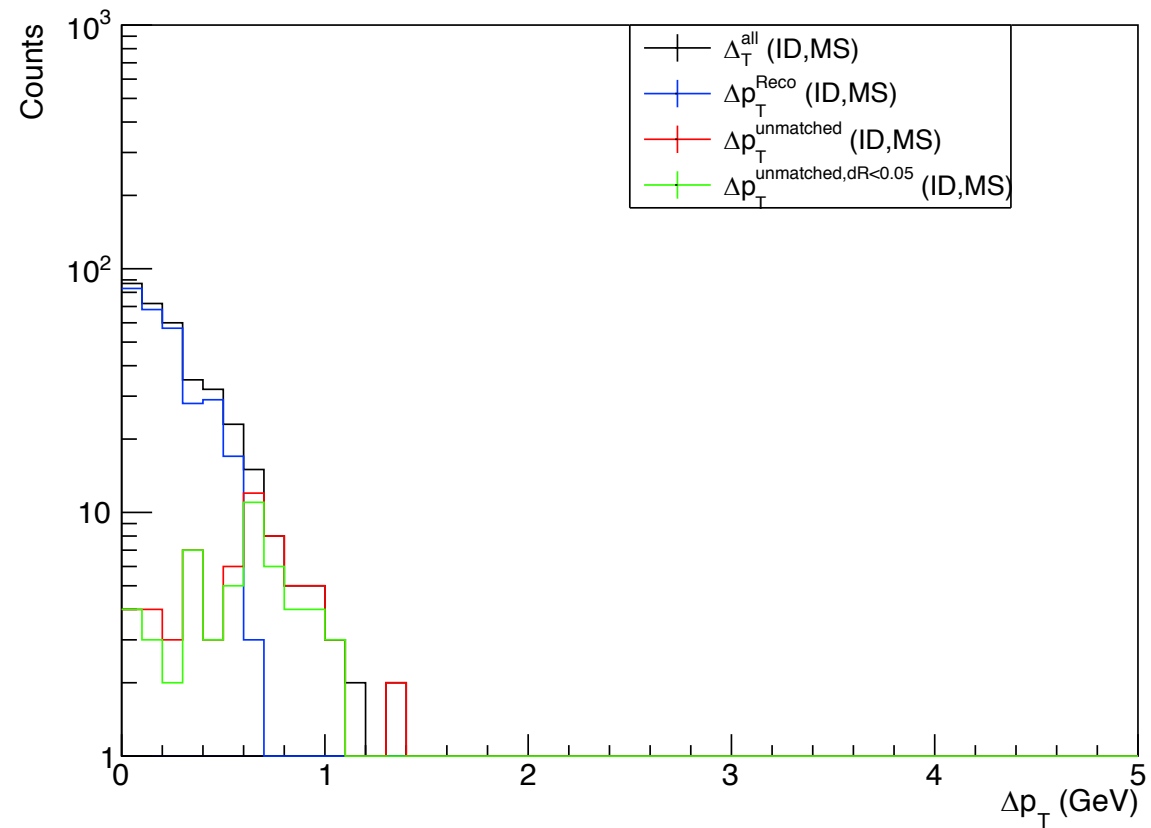


p_T Difference between ID and MS tracks at Selected p_T range

p_T Difference Distribution between ID and MS Tracks for ID Track from 5-5.5 GeV in pp



p_T Difference Distribution between ID and MS Tracks for ID Track from 5-5.5 GeV in overlay



Fcal dependence in overlay

