sPHENIX TPC software meeting
3rd March 2017

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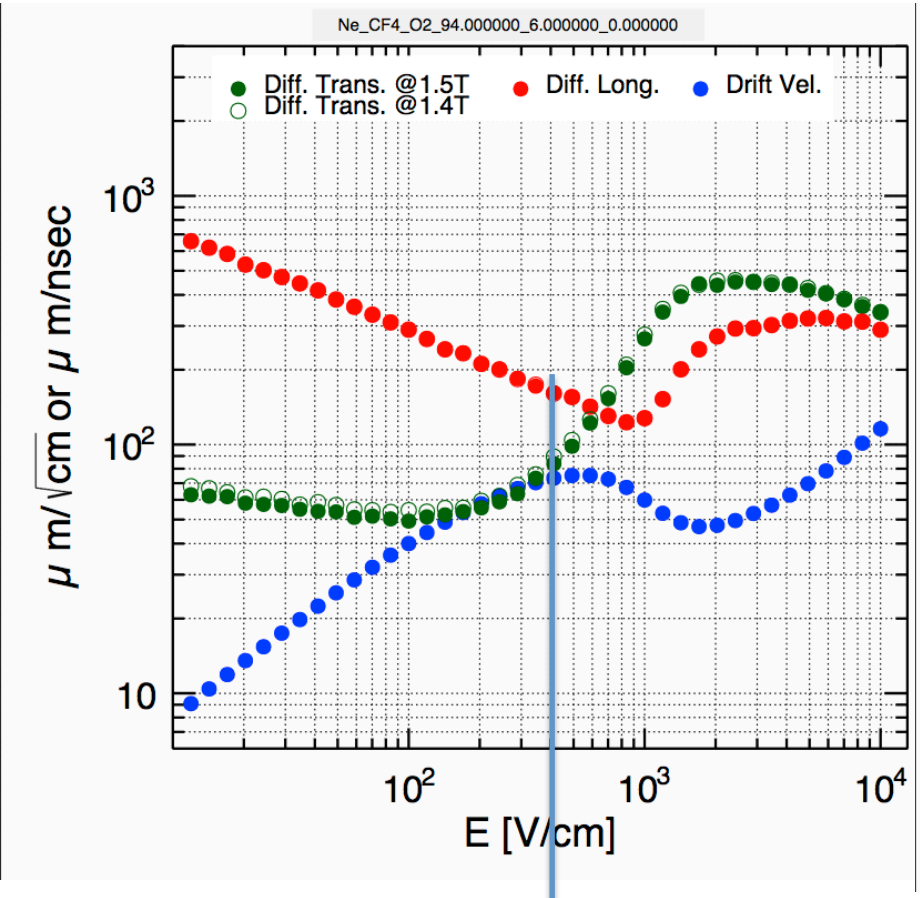
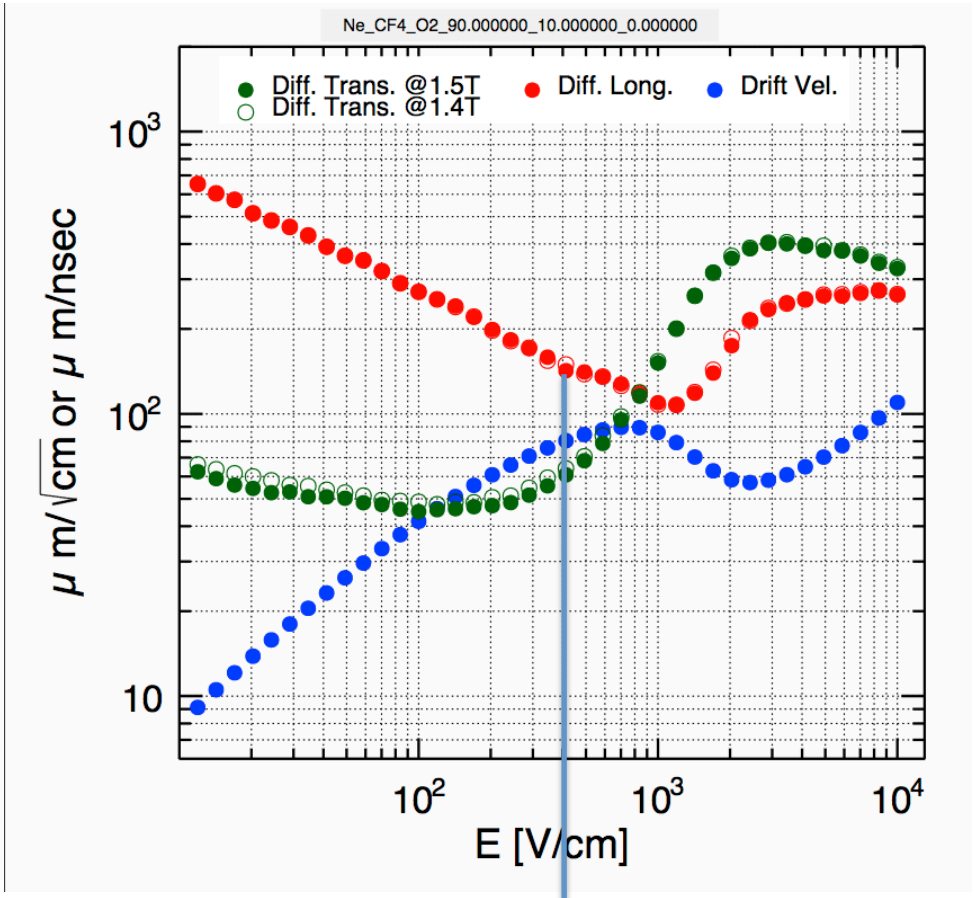




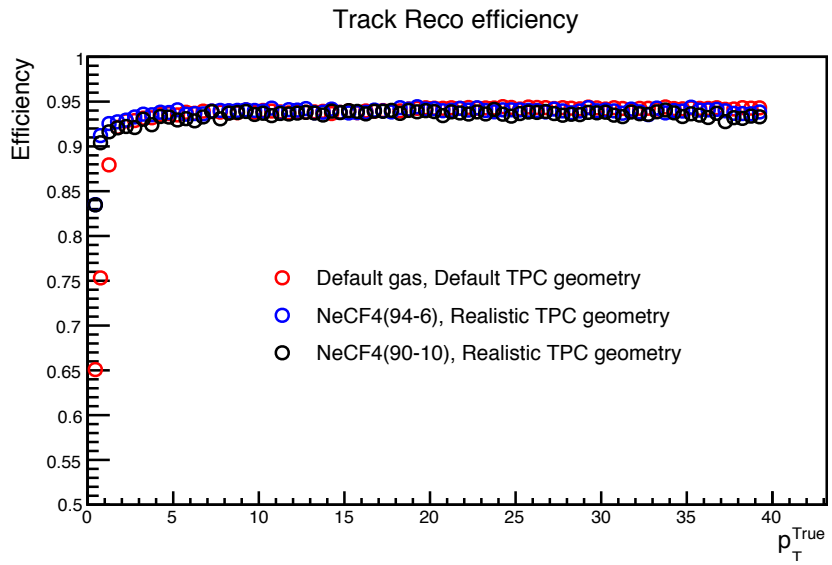
- Operating voltage of TPC = 400 V/cm
- Magnetic field = 1.4 T

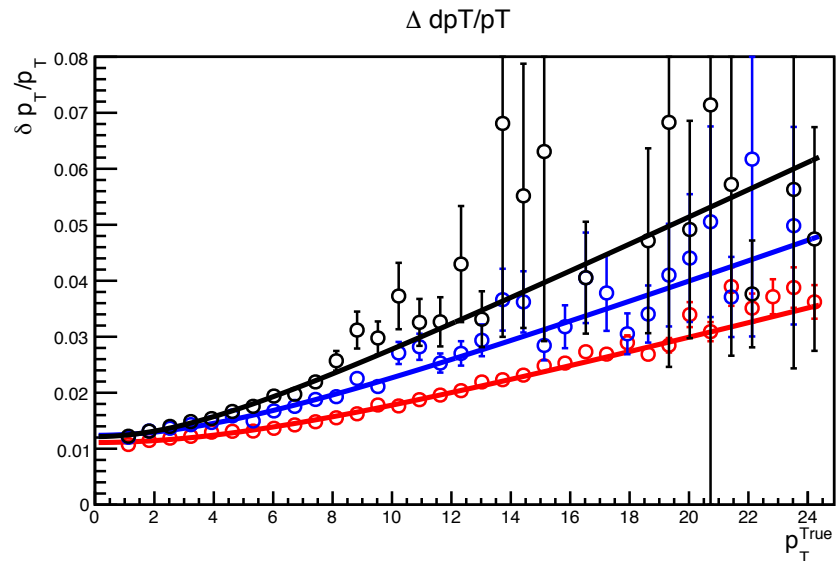
Transverse diffusion = 80 um/sqrt(cm)
Longitudinal diffusion = 160 um/sqrt(cm)
Drift velocity = 70 um/nsec
e per keV = 27

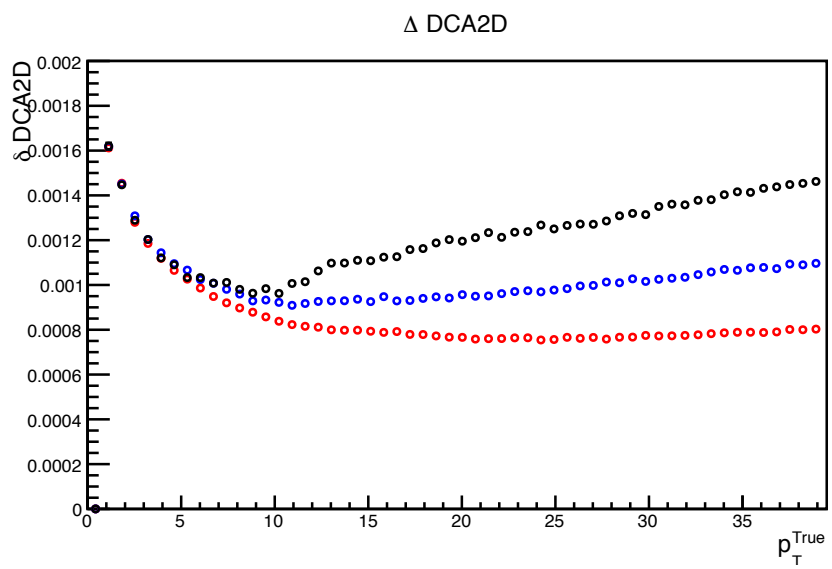
Transverse diffusion = 60 um/sqrt(cm)
Longitudinal diffusion = 120 um/sqrt(cm)
Drift velocity = 80 um/nsec
e per keV = 26

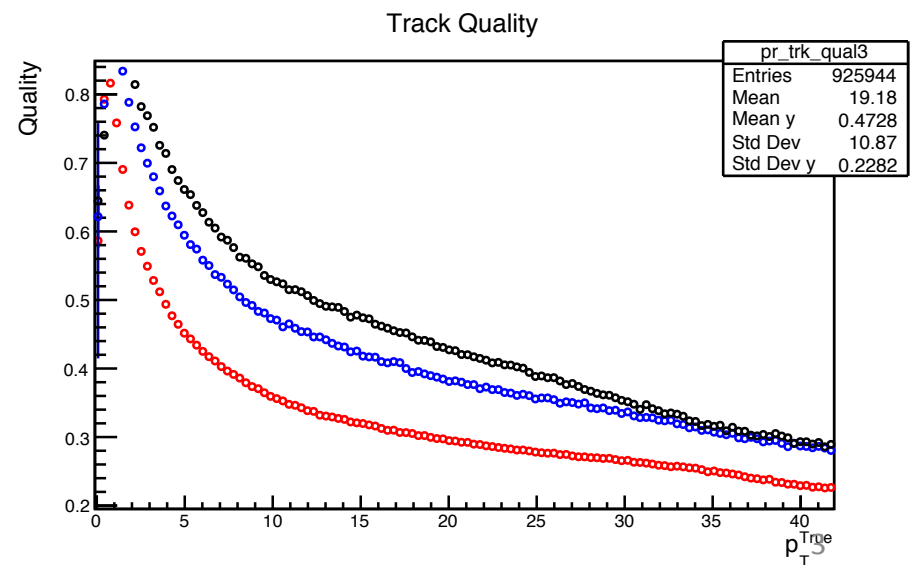
Default TPC geometry : 60 layers , 20 < R < 78 cm , fixed cell size
Realistic TPC geometry : 40 layers, 20 < R < 75 cm, realistic cell size , sPHENIX Github clusterizer

MAPS + IT +TPC :Pure pions





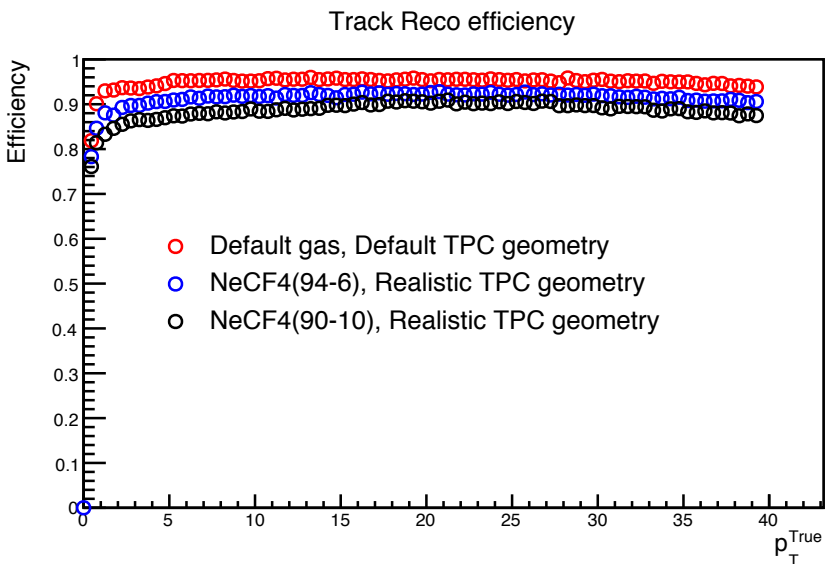


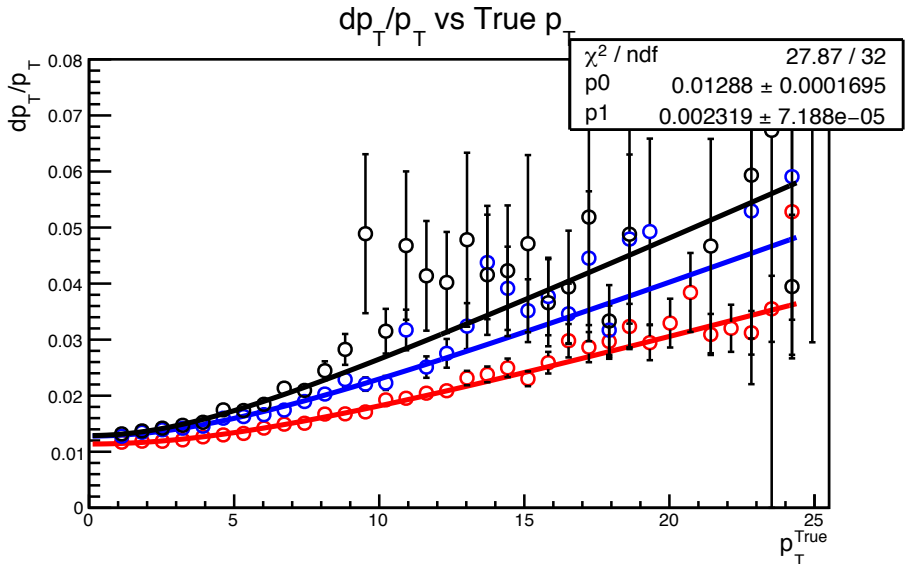


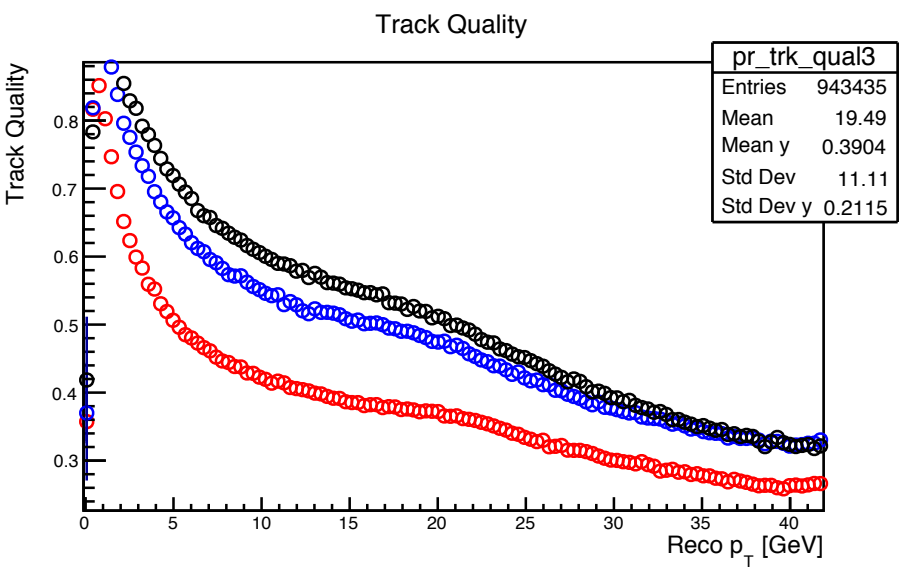
Default TPC geometry : 60 layers , 20 < R < 78 cm , fixed cell size

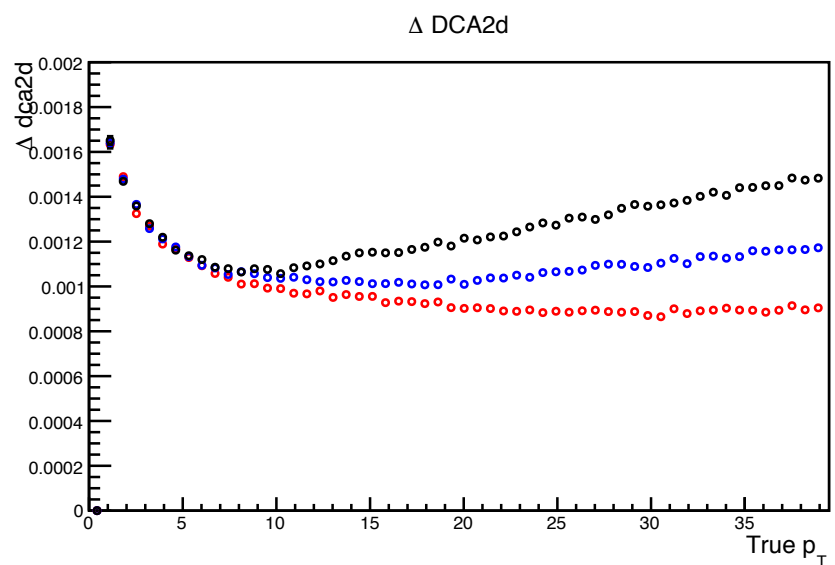
Realistic TPC geometry : 40 layers, 20 < R < 75 cm, realistic cell size , sPHENIX Github clusterizer

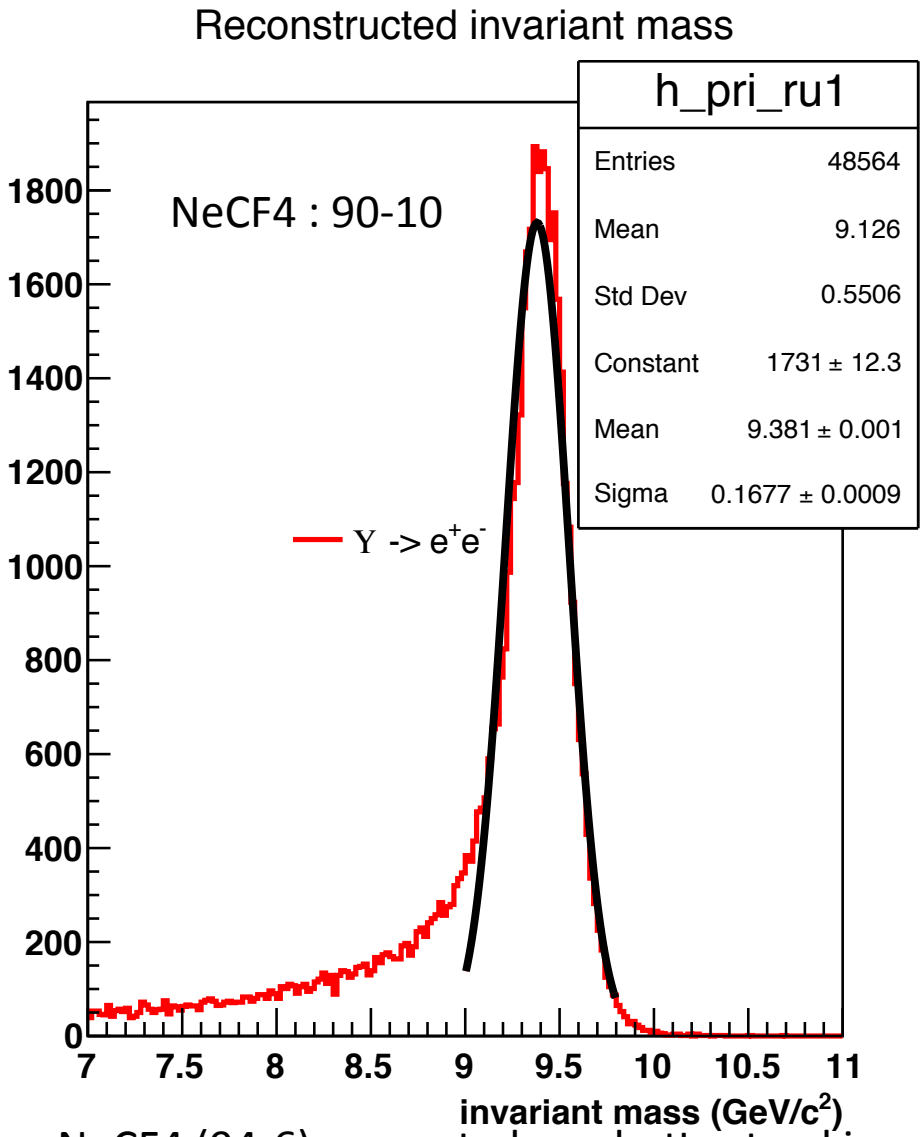
Hijing embedded pions : MAPS(cyl) + ITT(cyl) + TPC

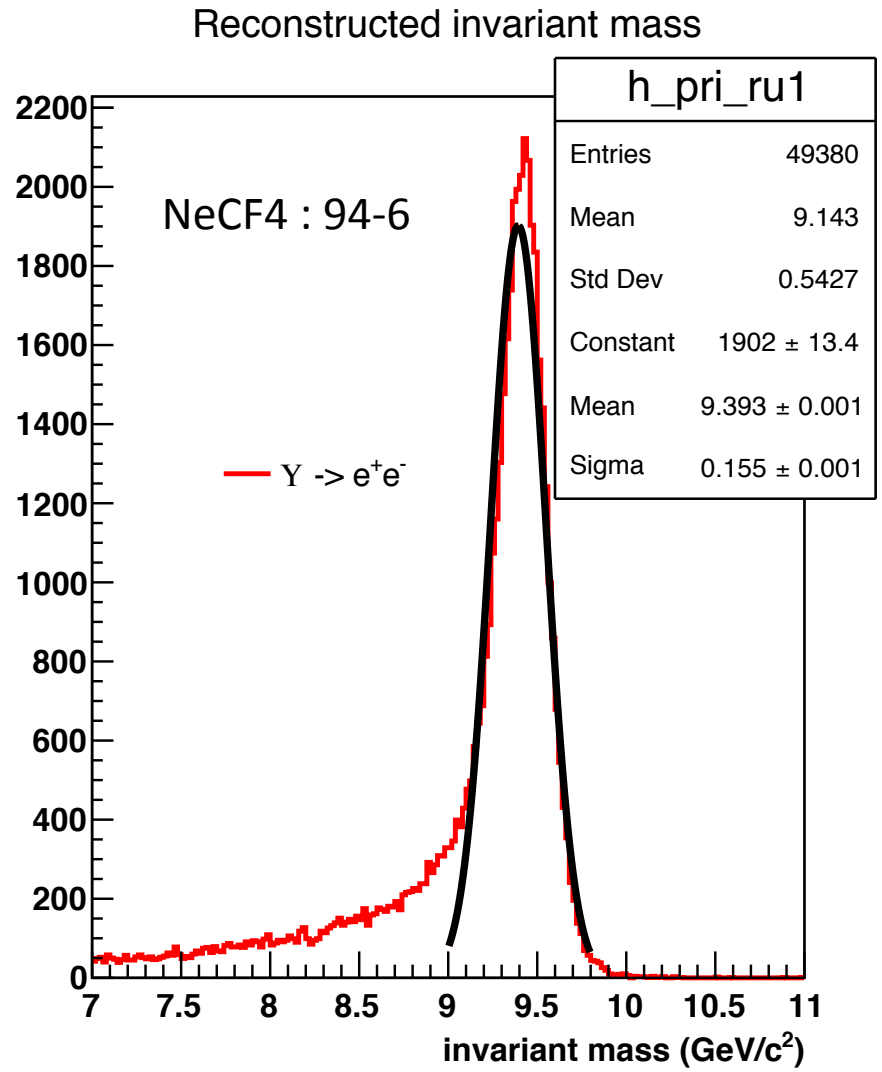






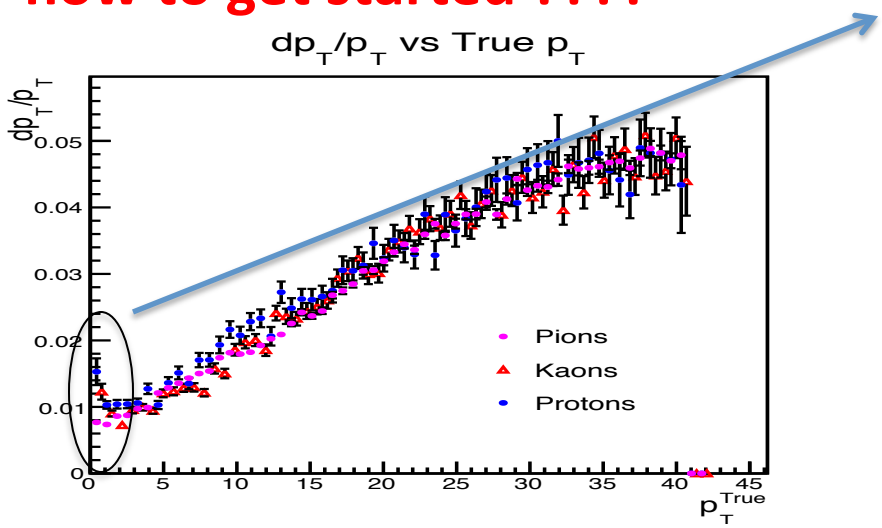
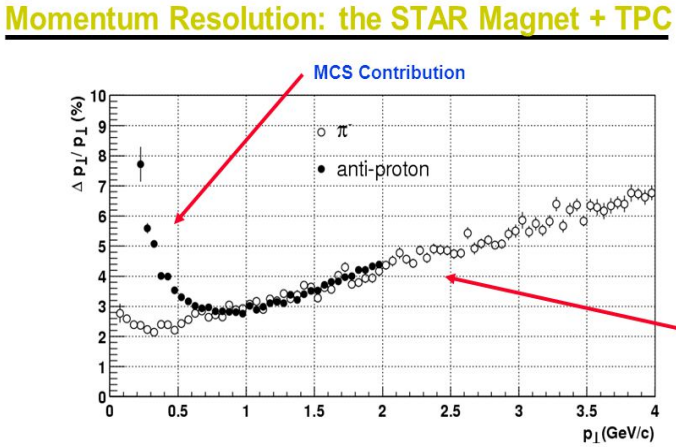






- NeCF4 (94-6) seems to have better tracking performance and also mass resolution as compared to NeCF4(90-10) though the mass resolution is above what we want.
- NeCF4(94-6) might be better candidate than NeCF4(90-10) as the drift velocity is at the plateau at operating voltage of TPC.
- Need to re-evaluate it after clusterizer related issues are fixed.

Feasibility of particle identification using TPC

Factors affecting dE/dx

- Ionization rate of gas
- Gain of the first GEM stage
- Radial width of TPC readout
- Number of TPC layers ???
- Planning to see the possibility of using TPC as particle identification as the pT resolution curve for different particles looks are quite separated from each other. **Any suggestions how to get started ????**