D^0 efficiency in Isobar

2022.2.28

PID method

if(p<1.6 && (!isTOFAvailable)) continue; clean pid

if(isTOFAvailable) nsigtof_X

else nsig_X hybrid PID

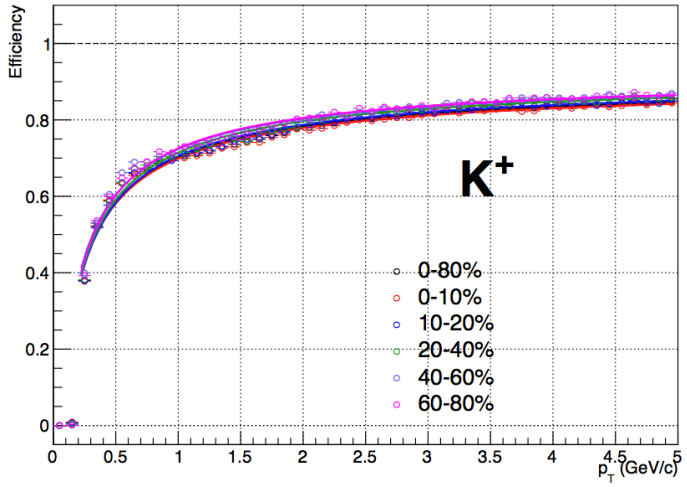
$\epsilon_{D^0}^{reco} = \epsilon_{Accept} \otimes \epsilon_{Track}$

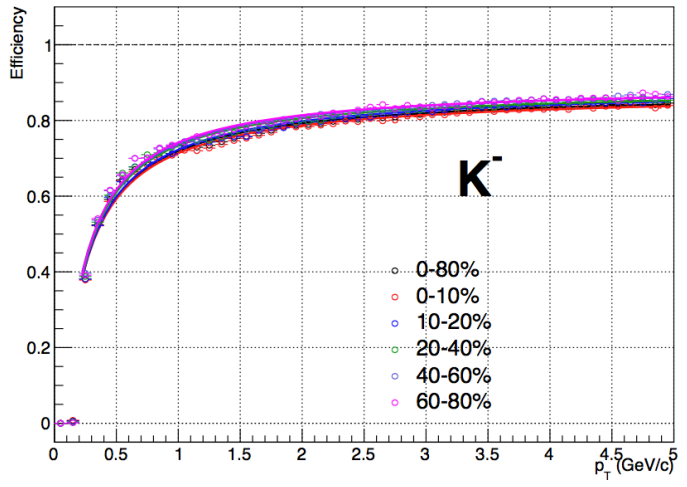
$\epsilon_{Track} = \epsilon_{TPC} \otimes \epsilon_{PID}$

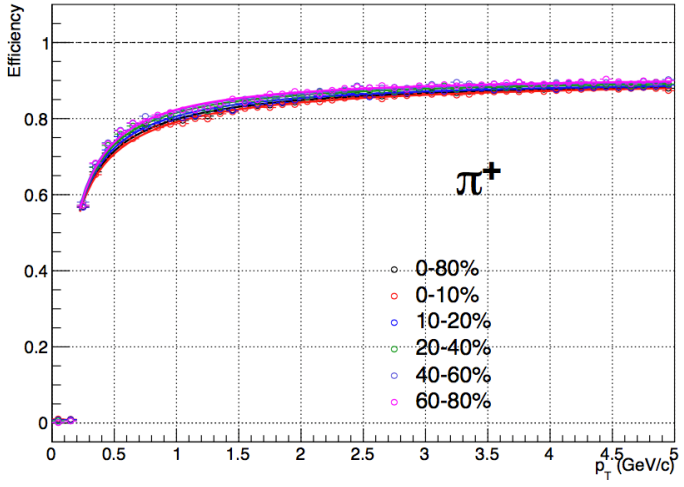
$\epsilon_{PID\_clean} = \epsilon_{n\sigma_X} \cdot \epsilon_{TOF} \cdot \epsilon_{\Delta\frac{1}{\beta}}$

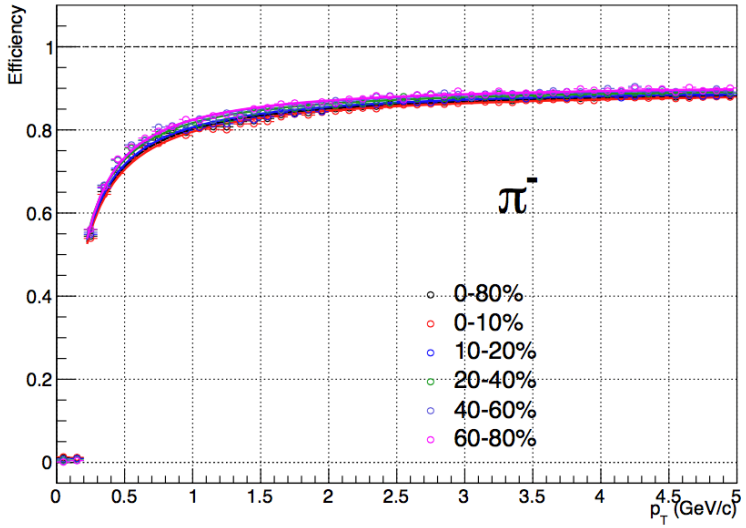
$\epsilon_{PID\_hybrid} = \epsilon_{n\sigma_X} \cdot \epsilon_{TOF} \cdot \epsilon_{\Delta\frac{1}{\beta}} + \epsilon_{n\sigma_X} \cdot (1 - \epsilon_{TOF})$

TPC tracking efficiency

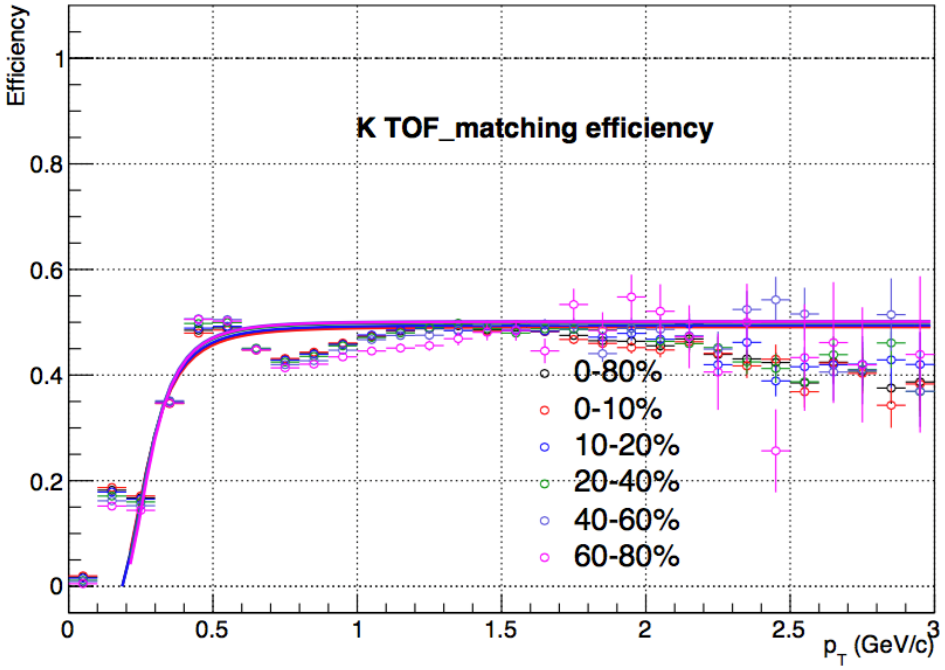


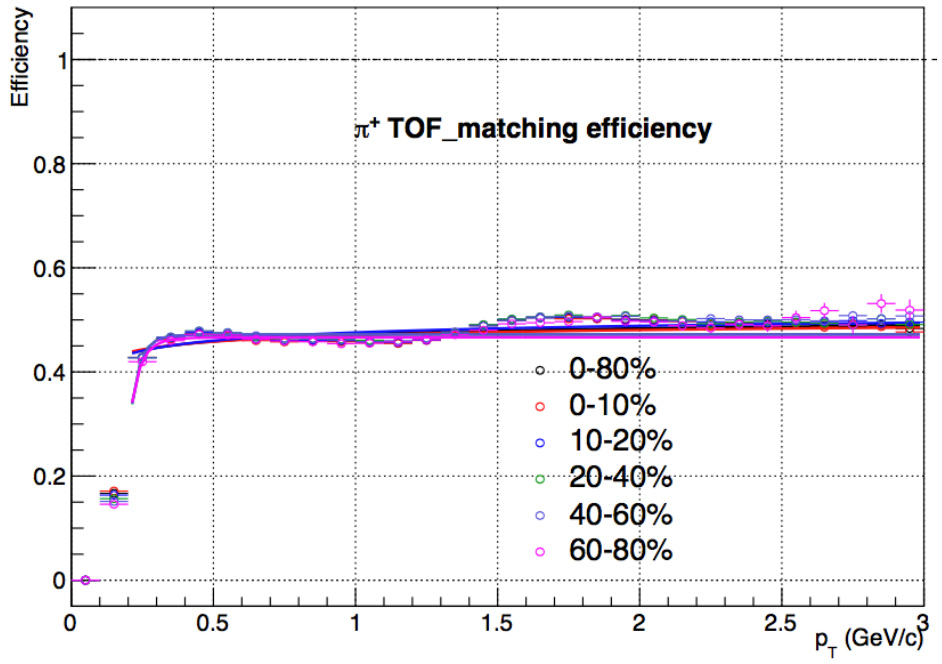


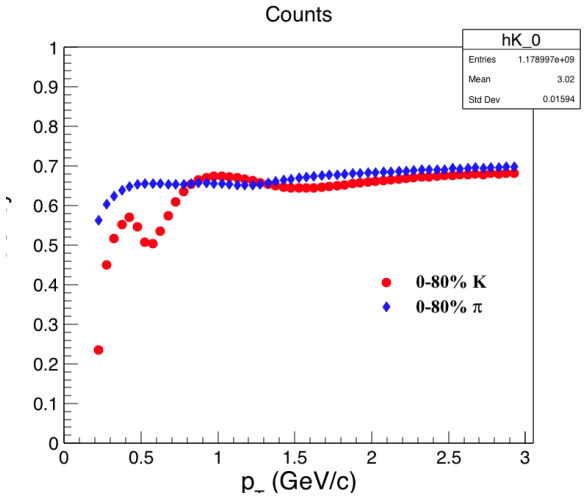




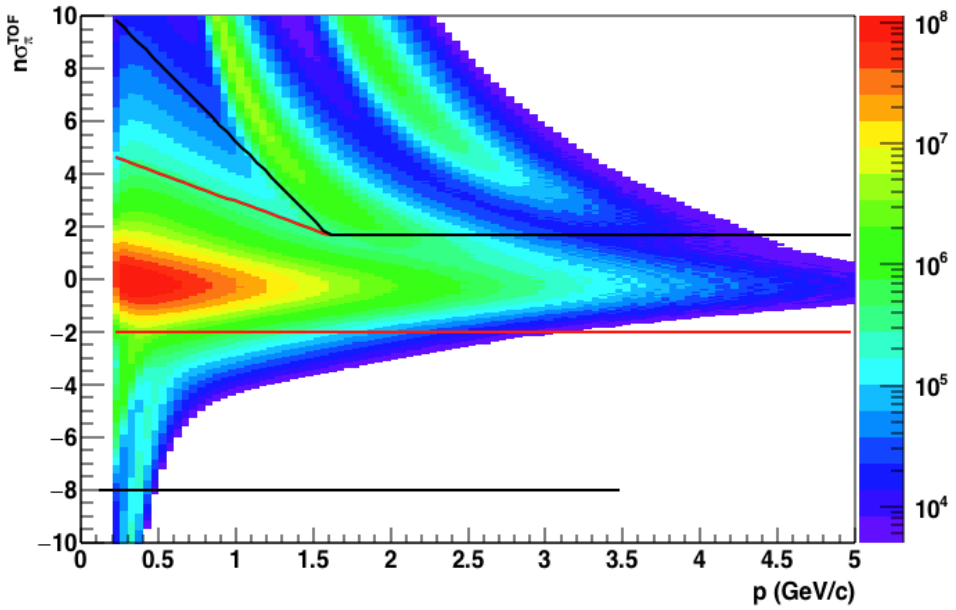
TOF matching efficiency

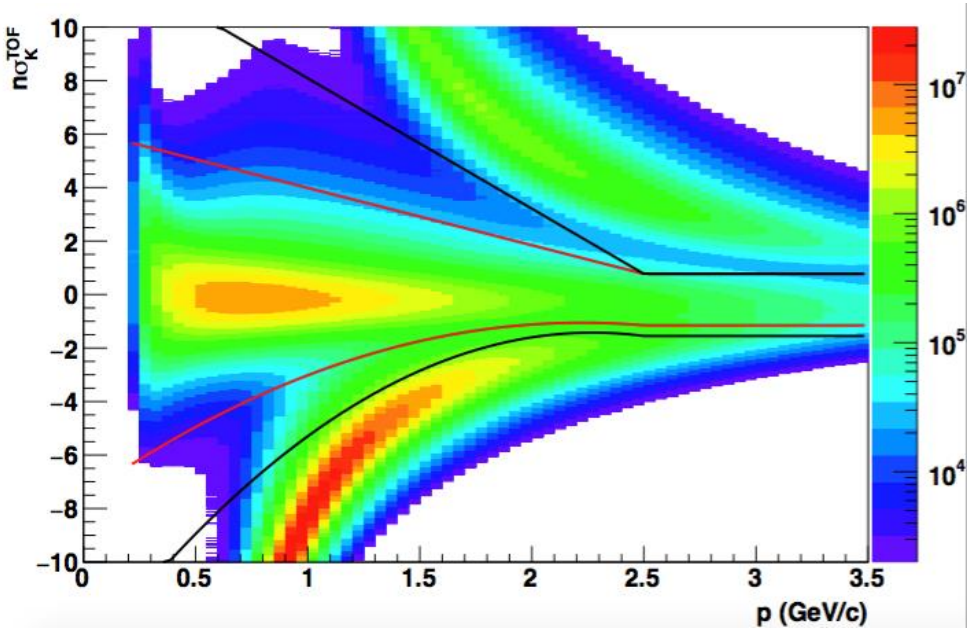


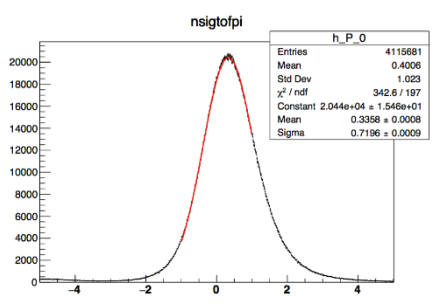


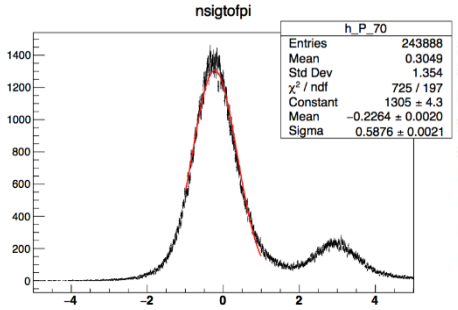


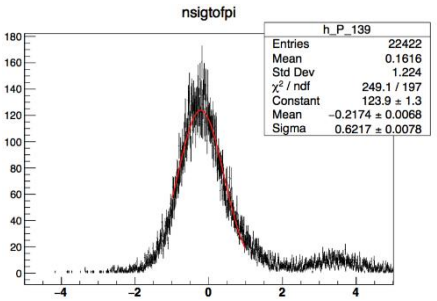
TOF cut efficiency

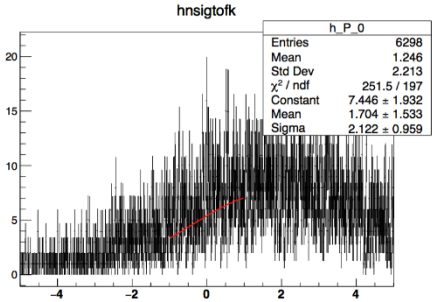


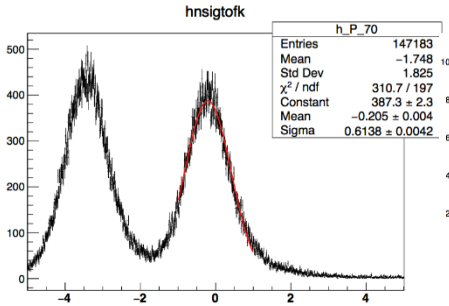


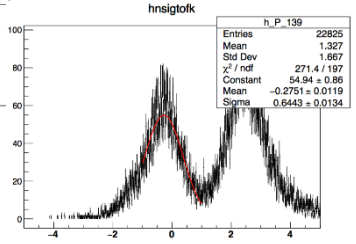




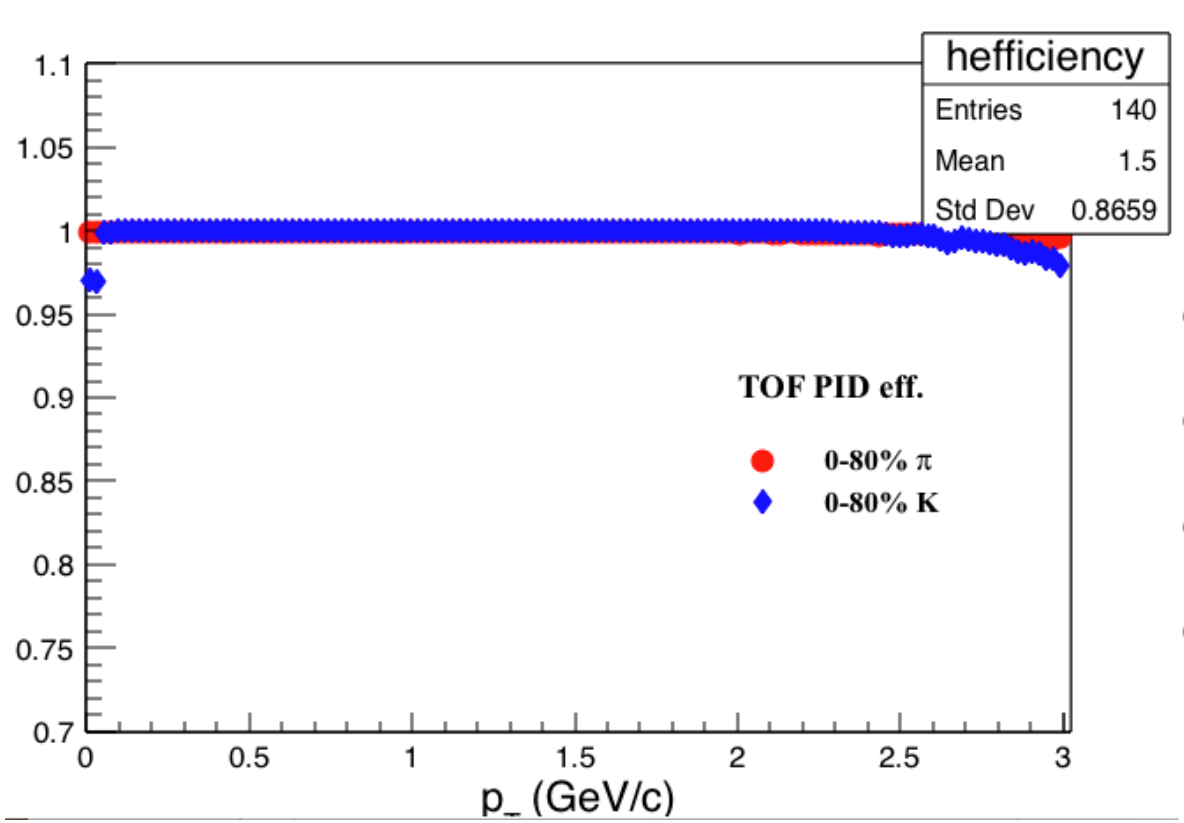


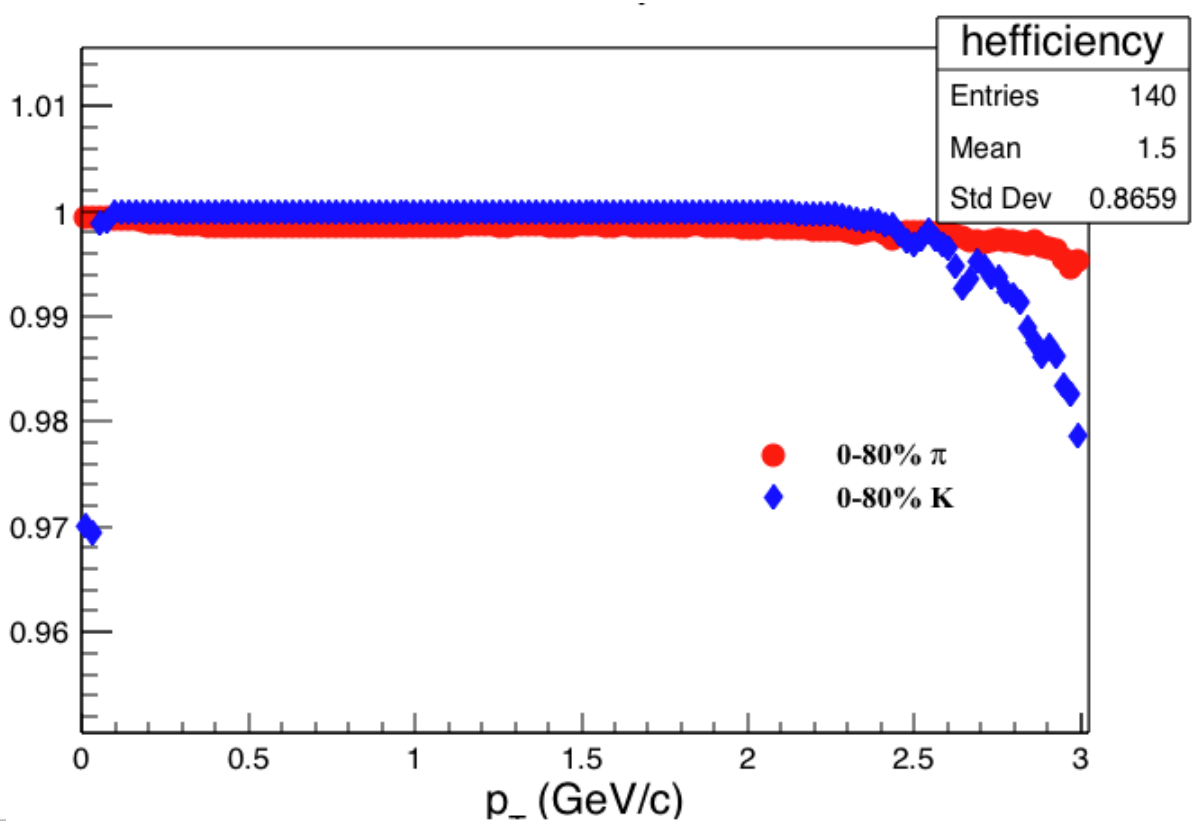






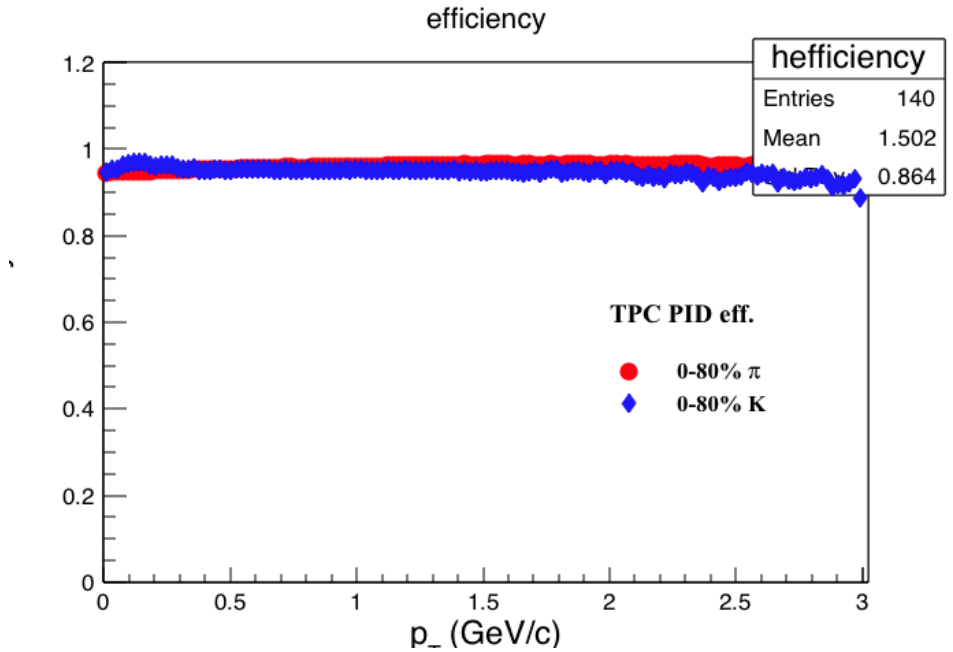
TOF cut efficiency

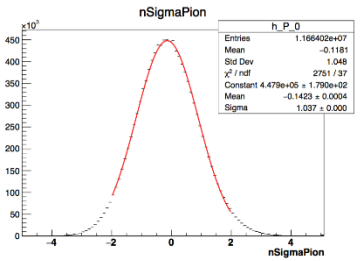


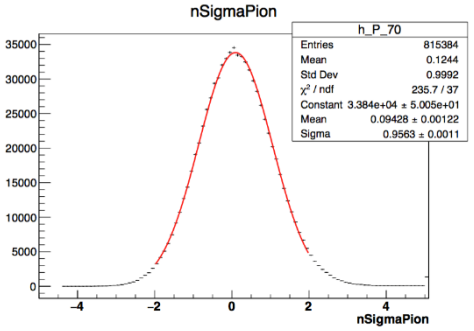


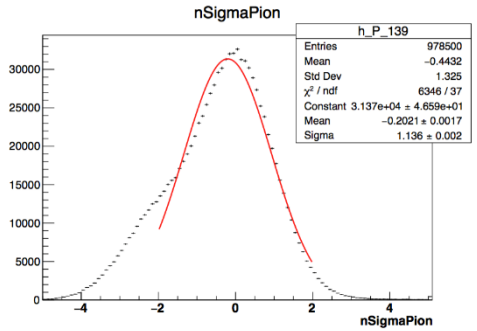
Need appropriate statistics

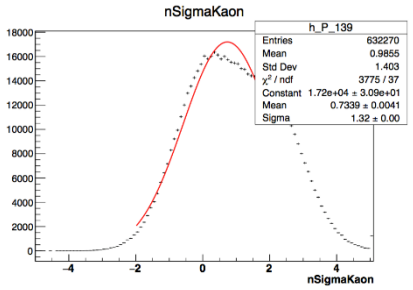
TPC cut efficiency

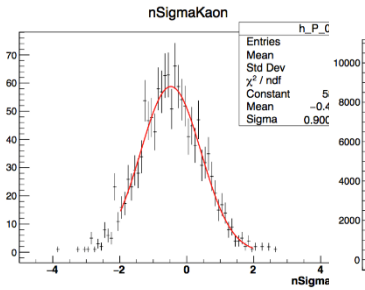


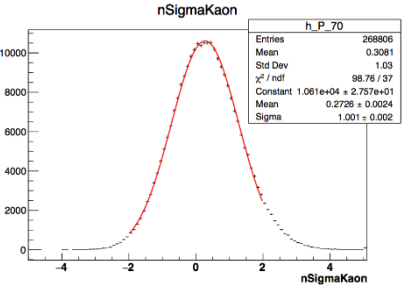




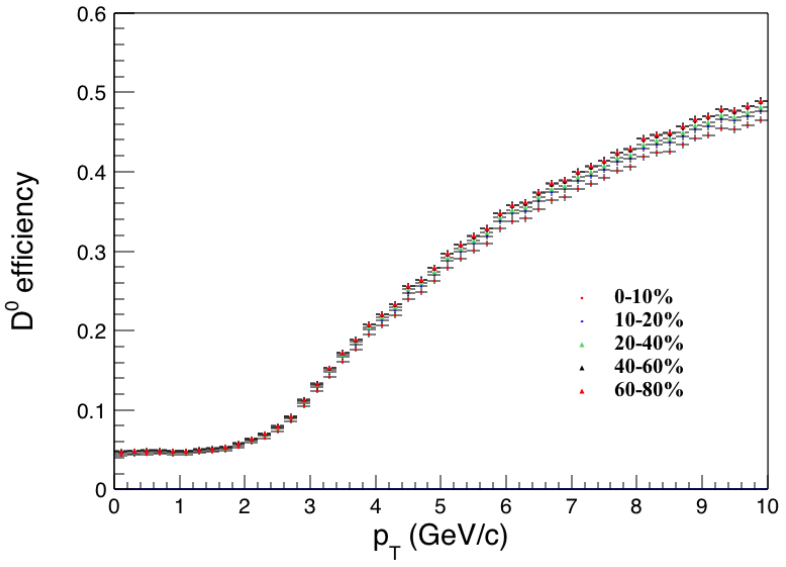


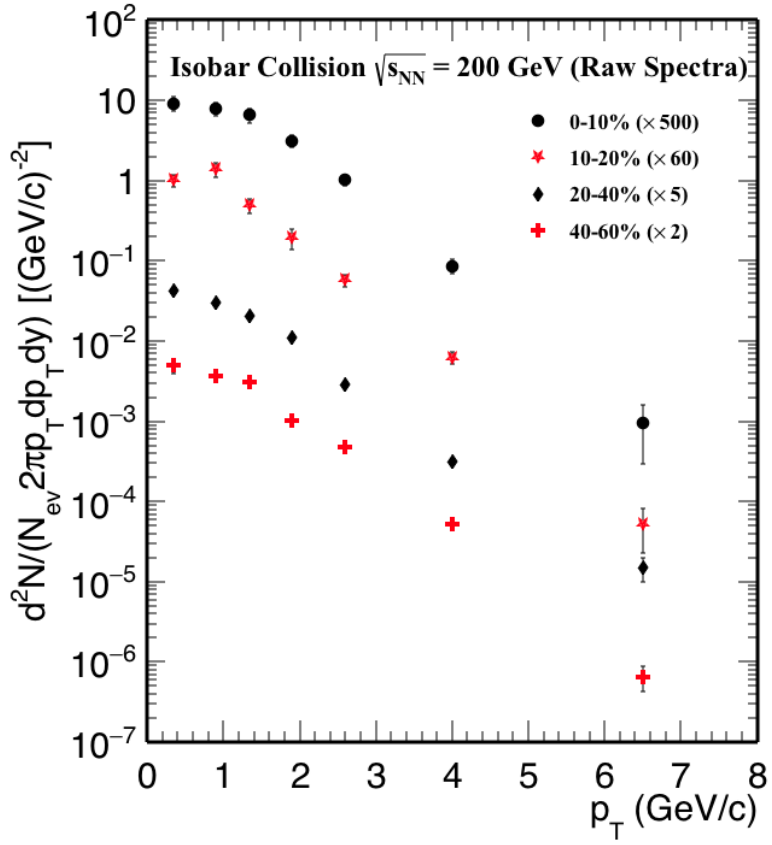






D^0 efficiency and spectra





1. Improve efficiency (cross check)
2. Average yield and System uncertainty

Raw yield extracted from gauss fit

Semester plan

- 2.28 - 4.21 D^0 data spectra (Z_r, R_u)

- 4.22 - 5.22 D^0 v_2 (model)

Glauber model for Isobar initial eccentricity simulation for D^0 spectra and v_2.