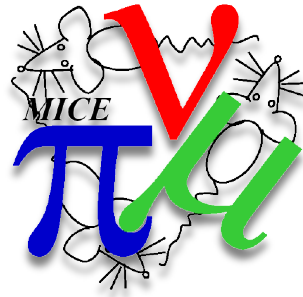


MCS in LH2 (Field-off)

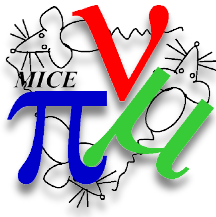


Gavriil Chatzitheodoridis
PhD **Supervisors:** Dr. Kevin Ronald &
Prof. Paul Soler

Contents

- Alignment
 - MC / Data comparison
 - Accuracy of spacepoints & track projection in MC
 - Pattern recognition & Kalman comparison w.r.t. the alignment
- Conclusions
- Comments on PID

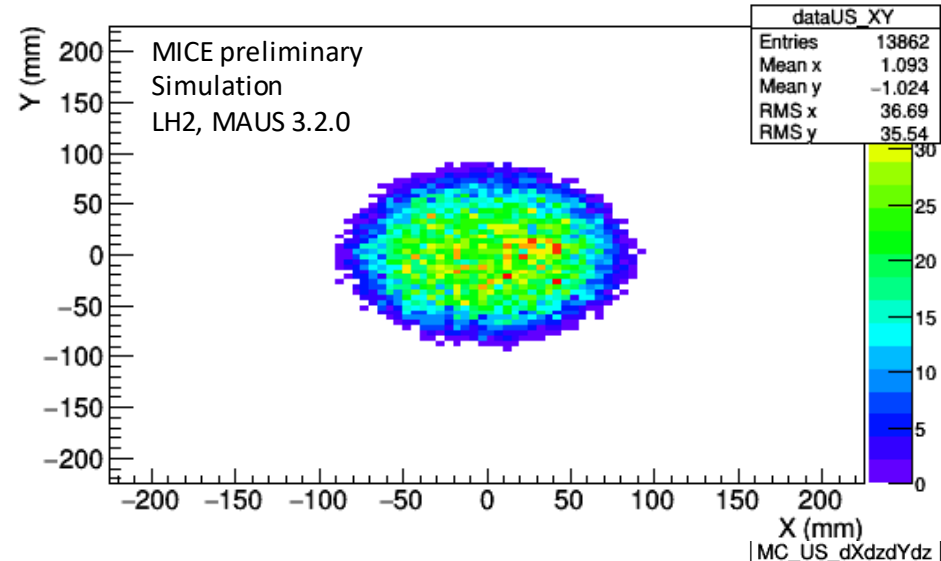
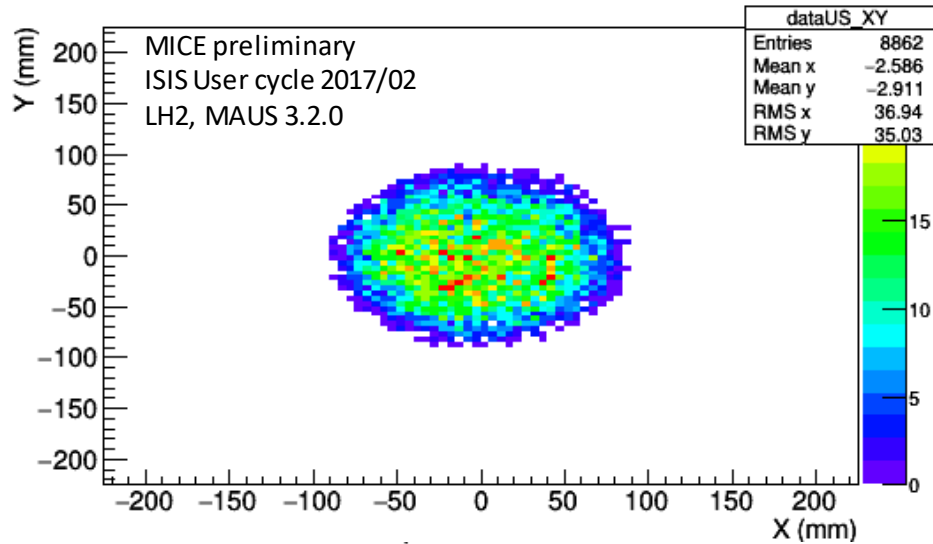
MC Recon/Data



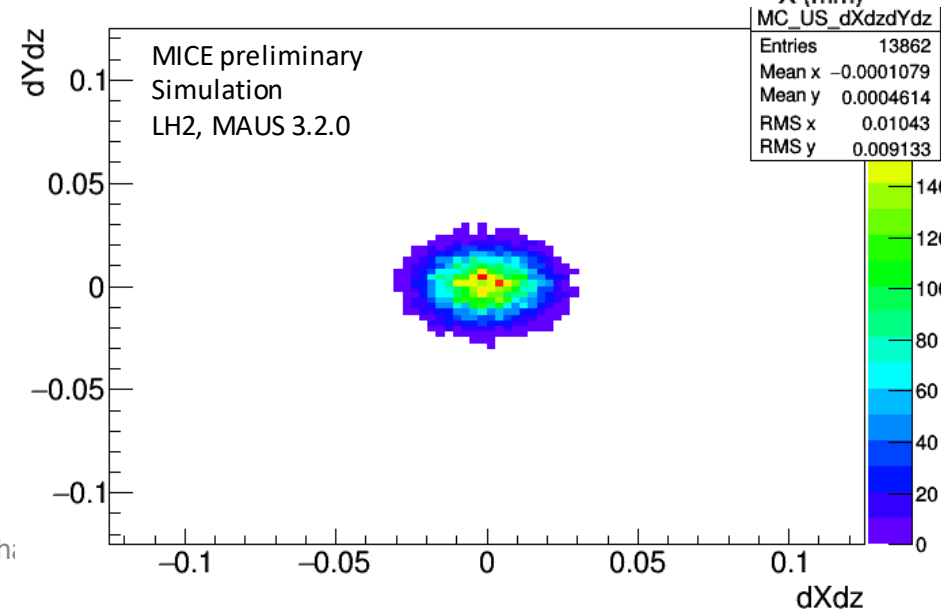
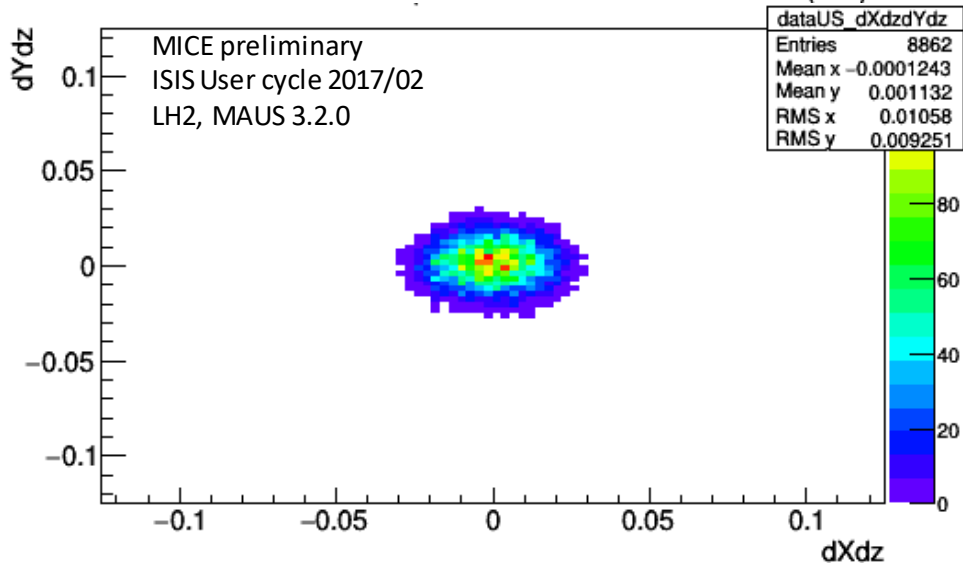
Beam position/direction

Data

MC

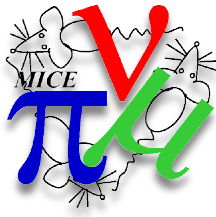


X/Y



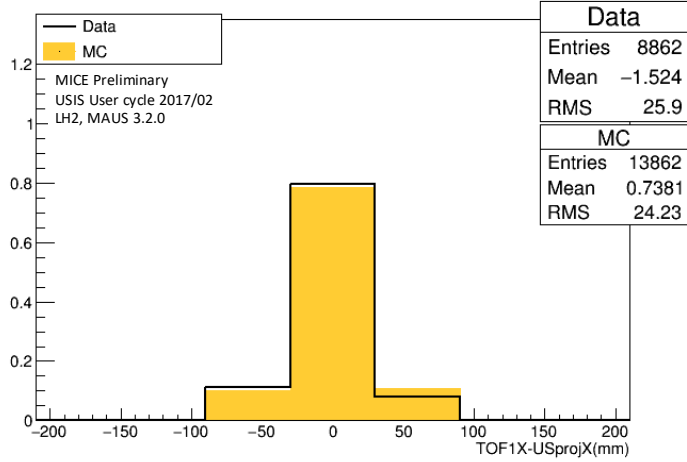
dXdz/dYdz

MC Recon/Data

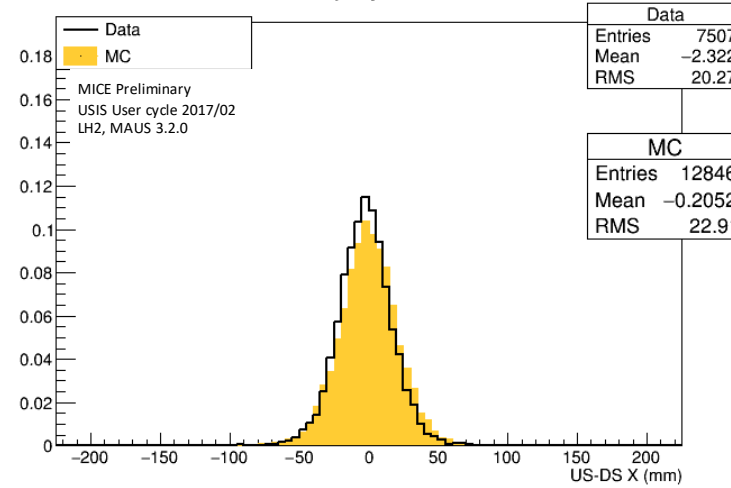


Residuals of SP & projections from adjacent trackers

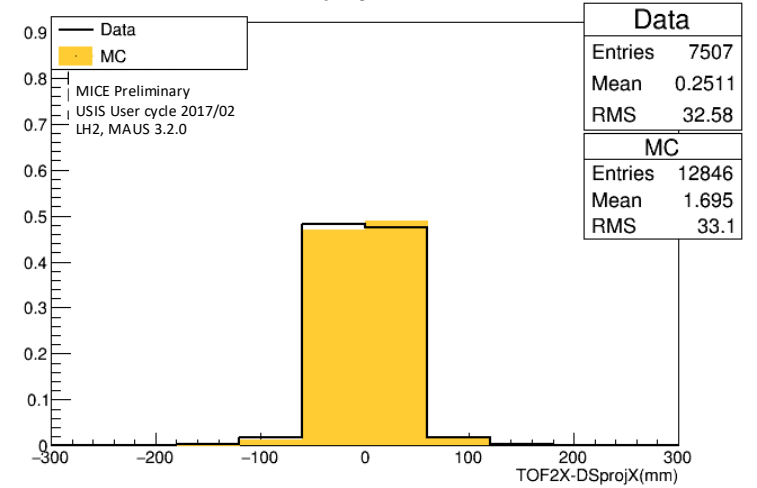
SP - proj. TOF1X



UST-DST proj. at absorber

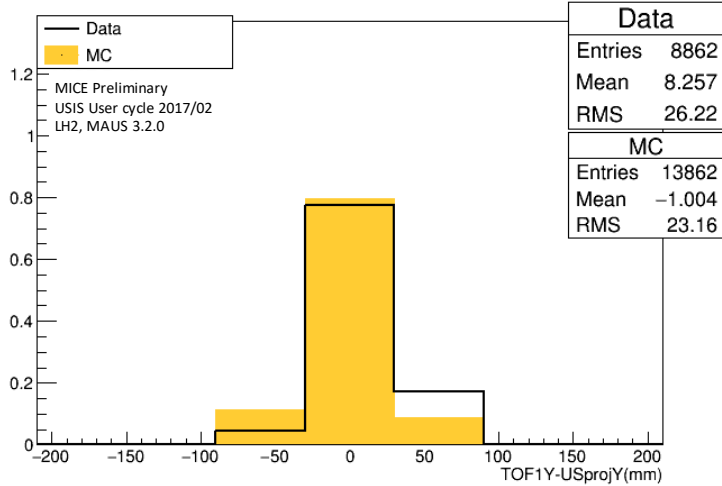


SP - proj. TOF2X

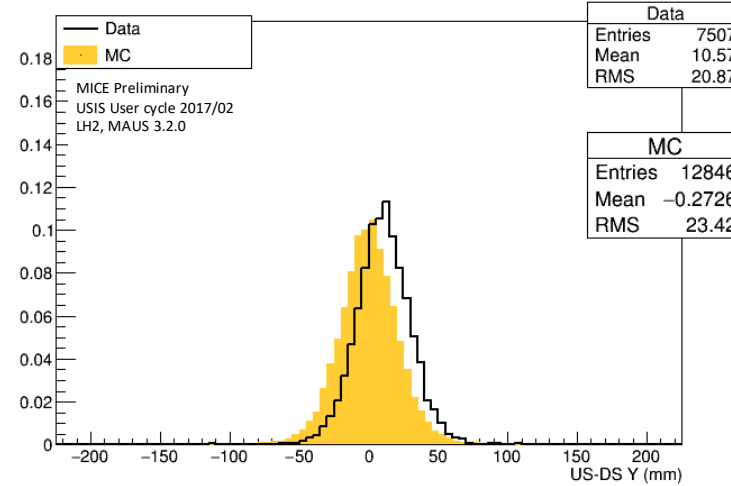


X

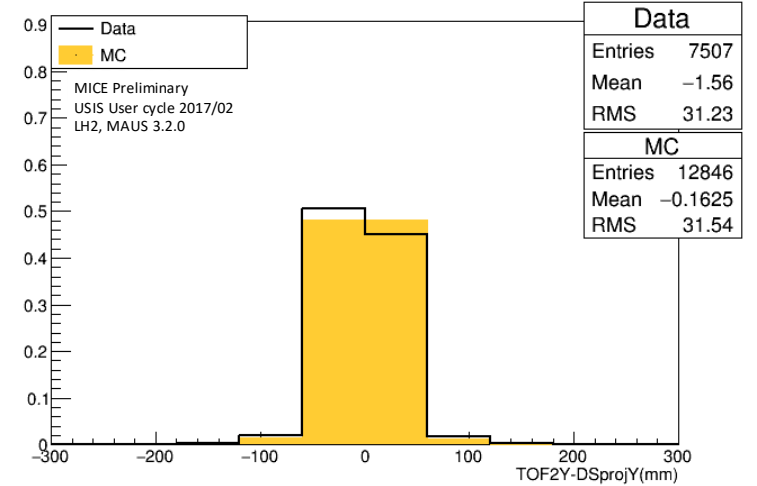
SP - proj. TOF1Y



UST-DST proj. at absorber



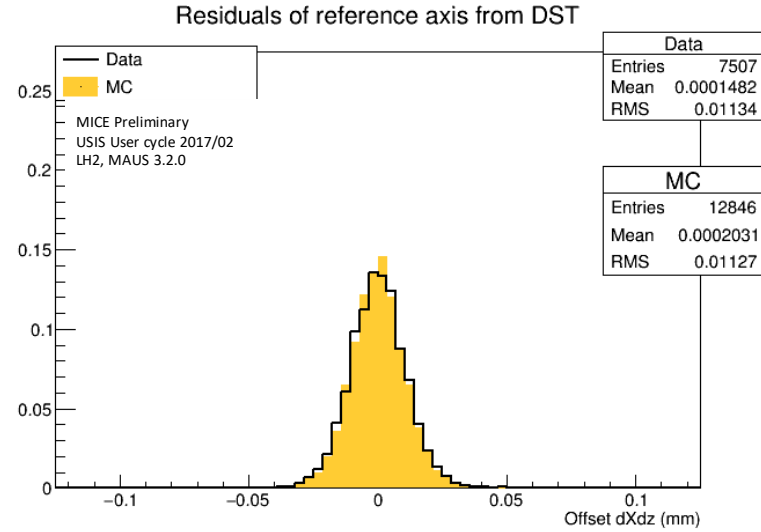
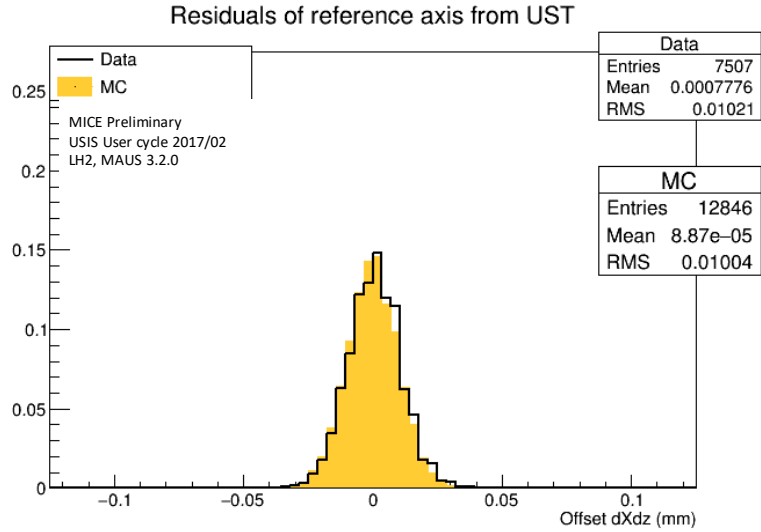
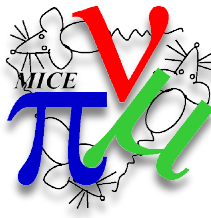
SP - proj. TOF2Y



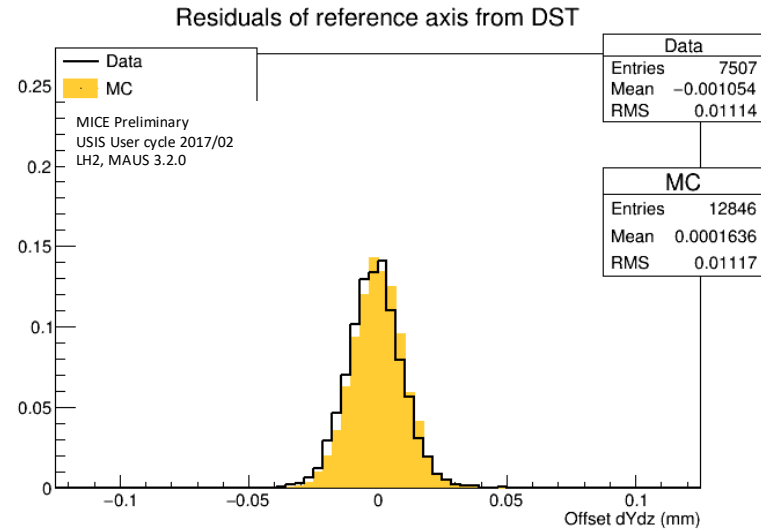
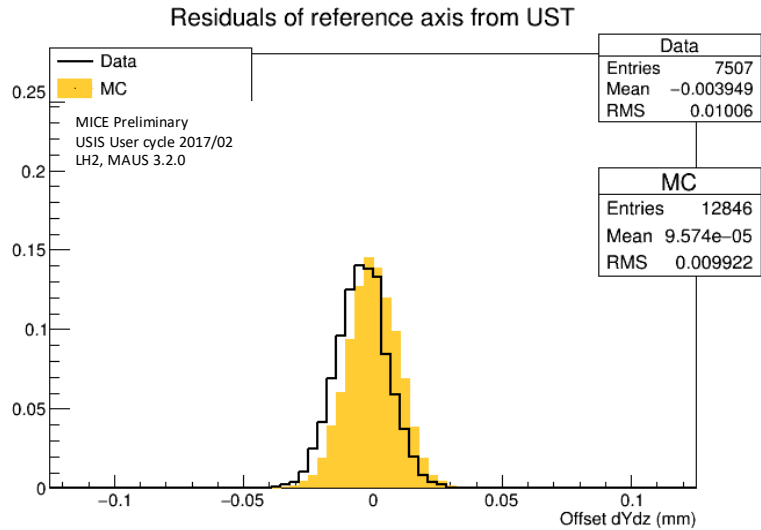
Y

MC Recon/Data

Residuals with TOF21 track



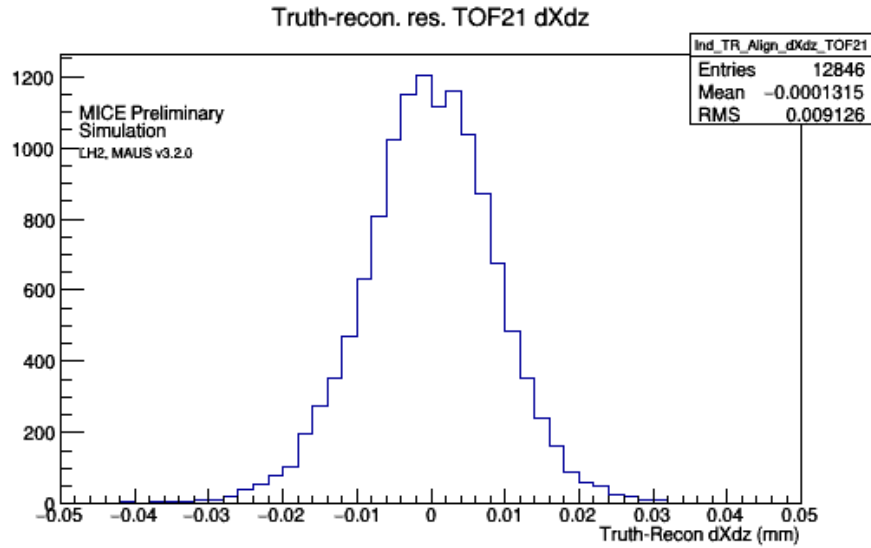
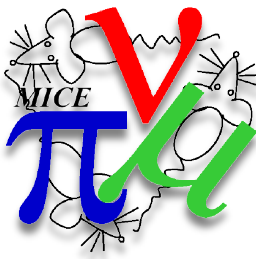
dXdz



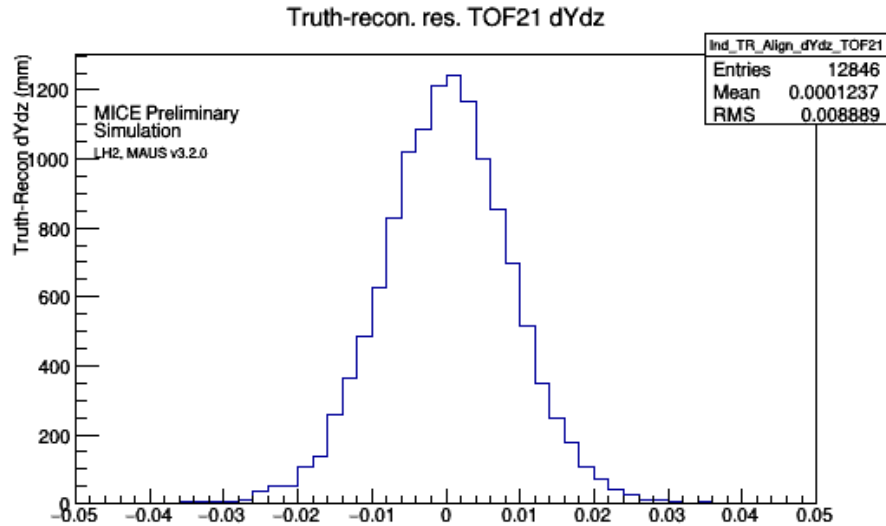
dYdz

MC Recon/Truth

Residuals of reconstructed reference track & Truth



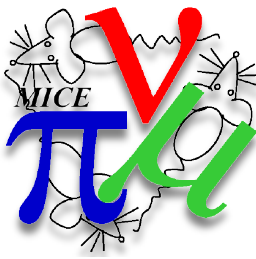
dX/dZ



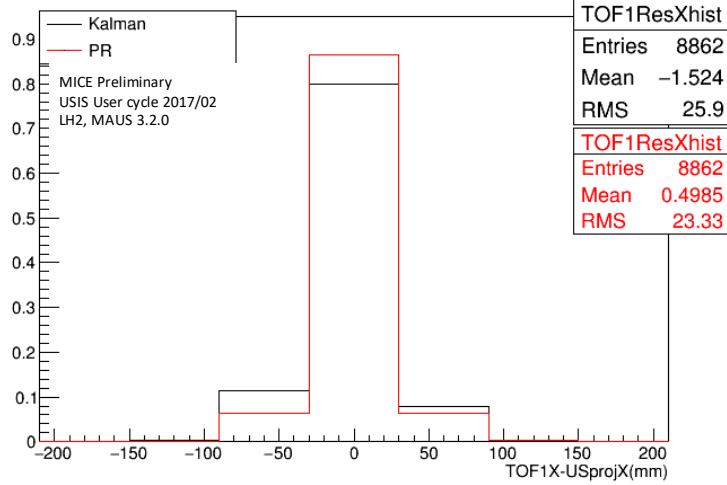
dY/dZ

Data - Kalman/PR

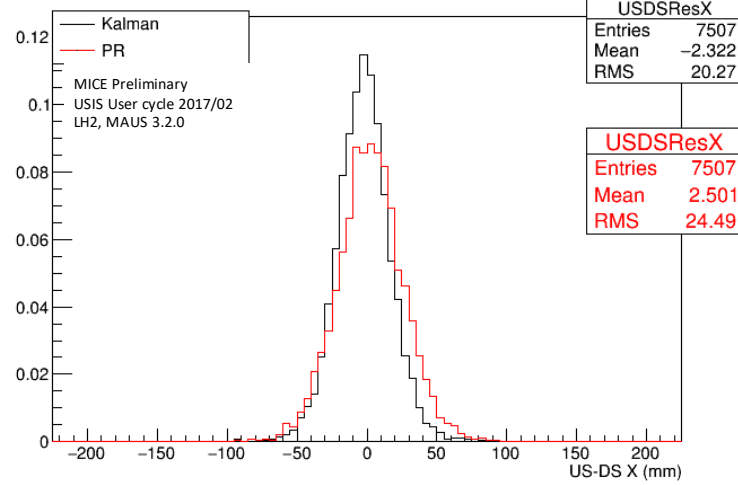
Residuals of projections



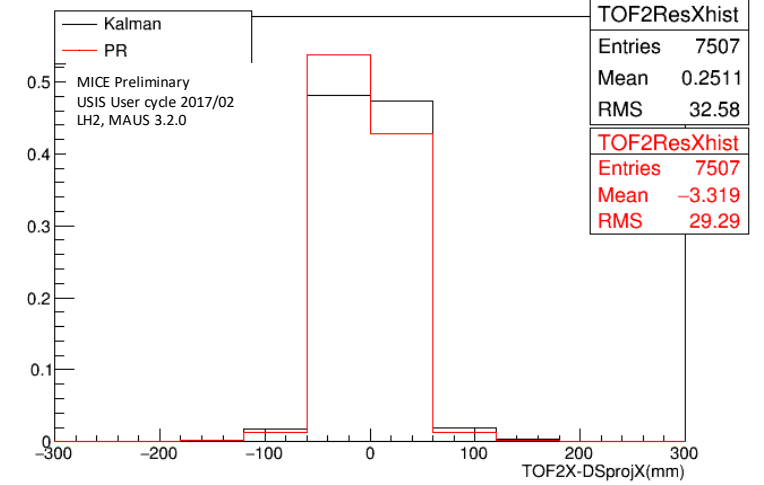
SP - proj. TOF1X



UST-DST proj. at absorber

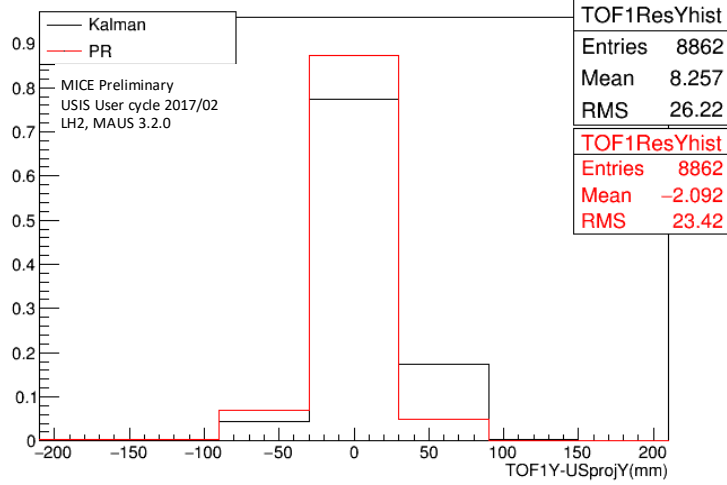


SP - proj. TOF2X

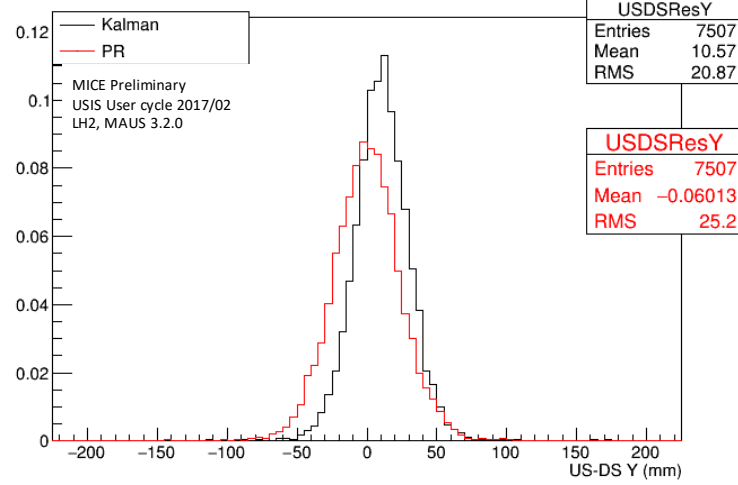


X

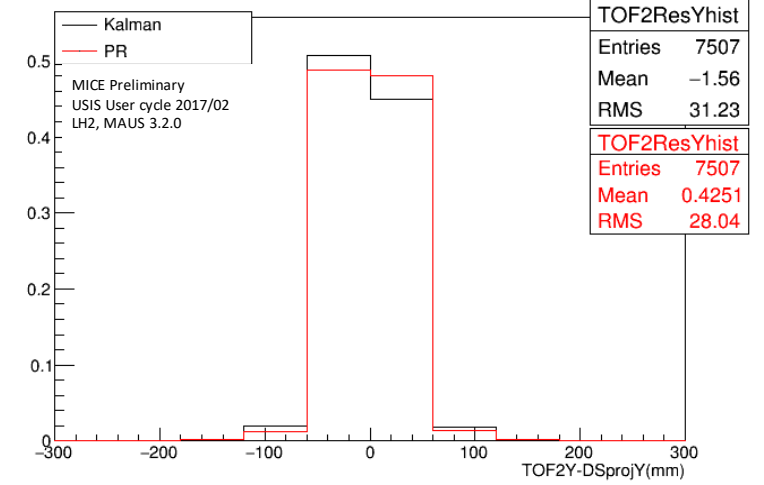
SP - proj. TOF1Y



UST-DST proj. at absorber



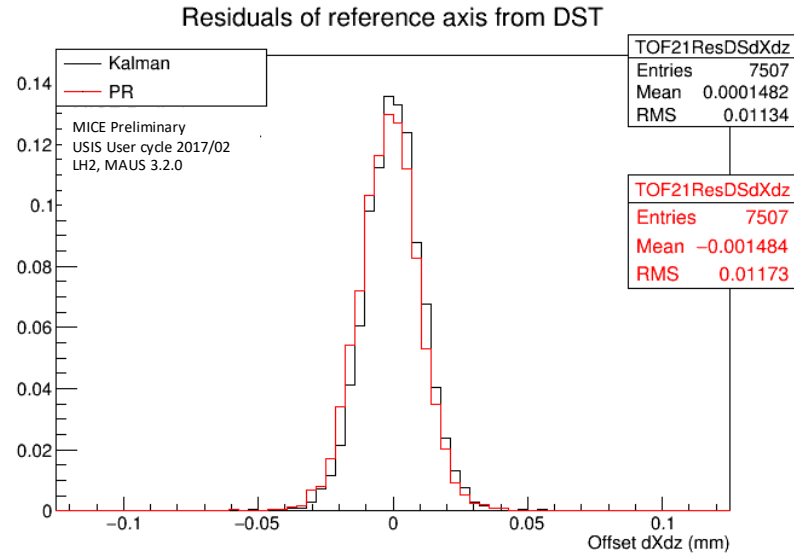
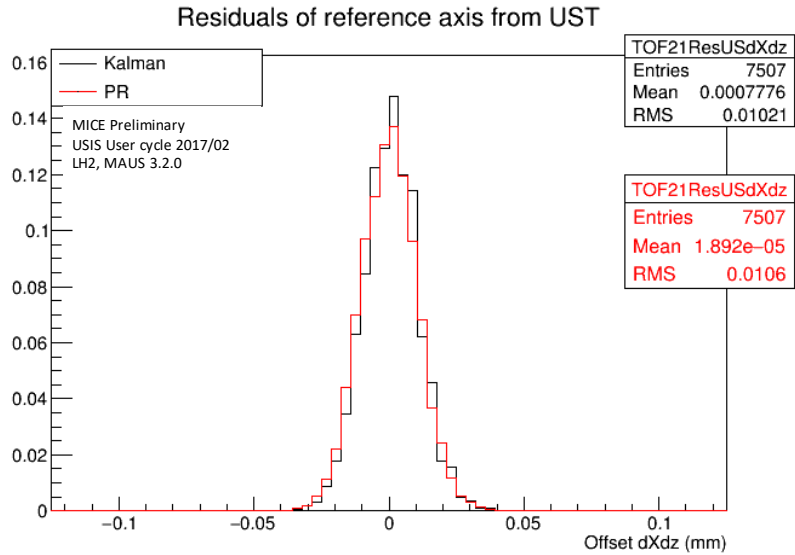
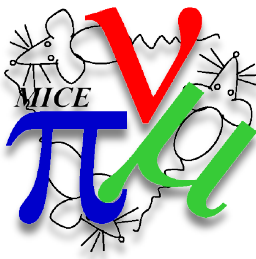
SP - proj. TOF2Y



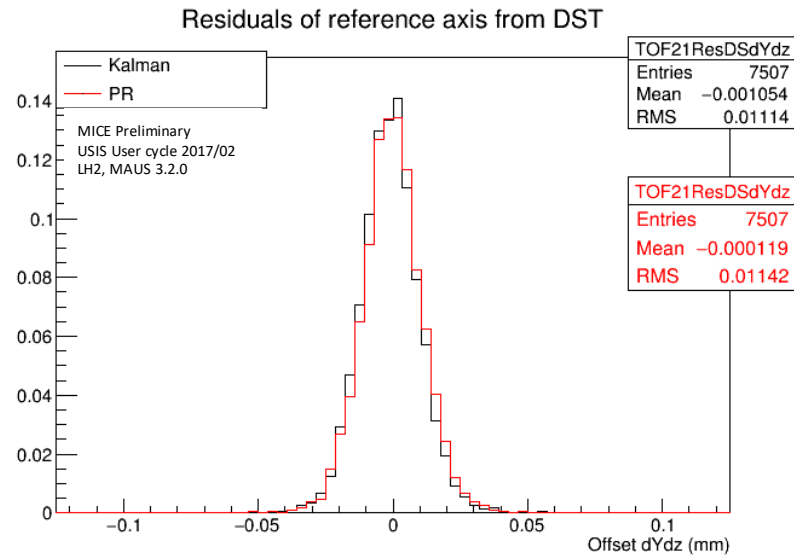
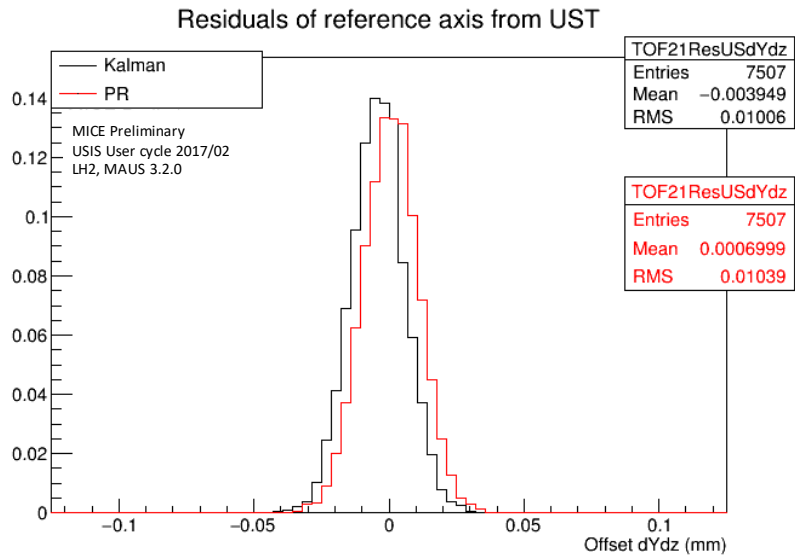
Y

Data – Kalman/PR

Residuals of US & DS tracks gradients from TOF21 (reference track)



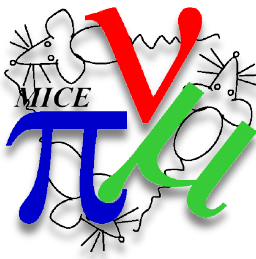
dX/dZ



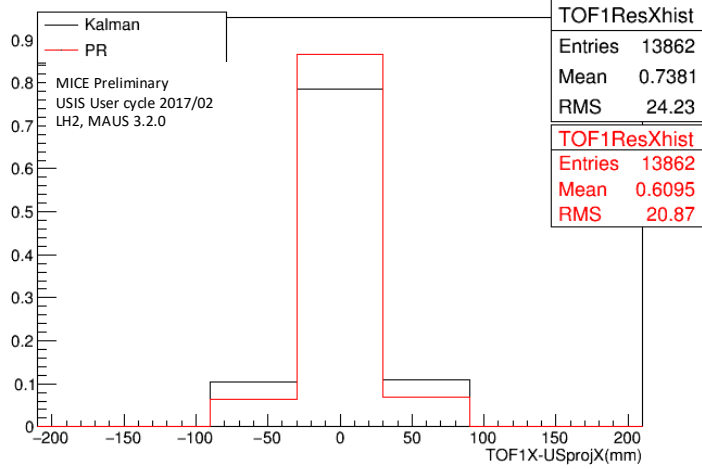
dY/dZ

MC Recon - Kalman/PR

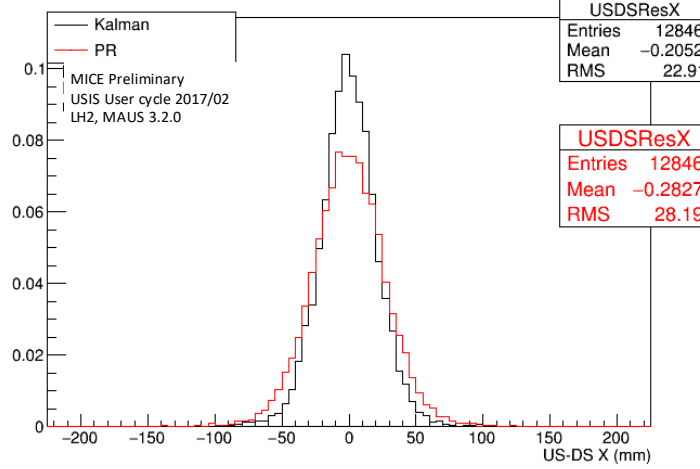
Residuals of projections



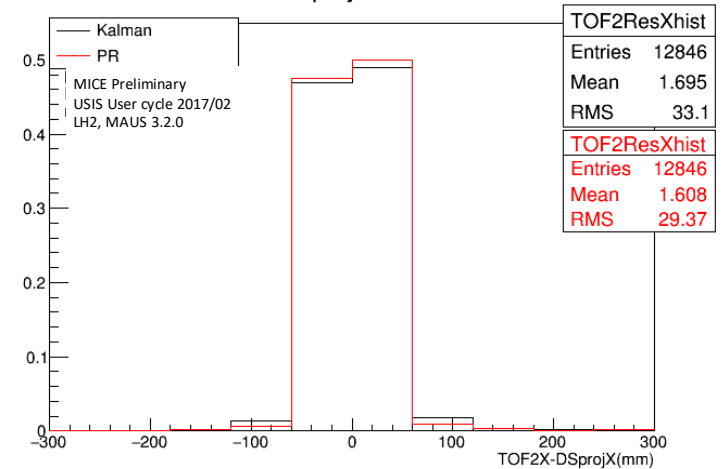
SP - proj. TOF1X



UST-DST proj. at absorber

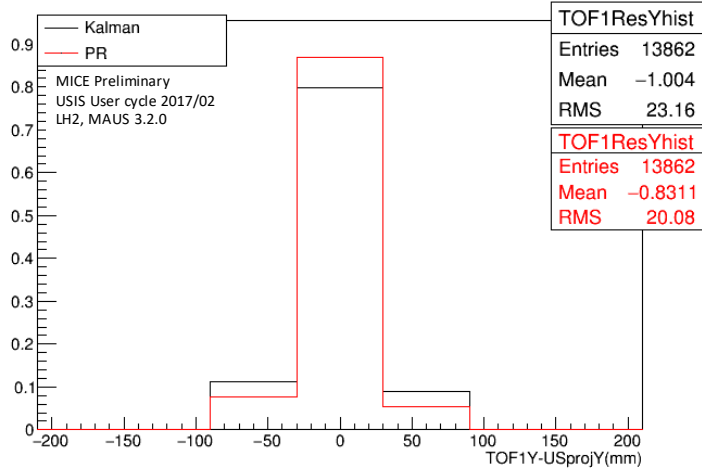


SP - proj. TOF2X

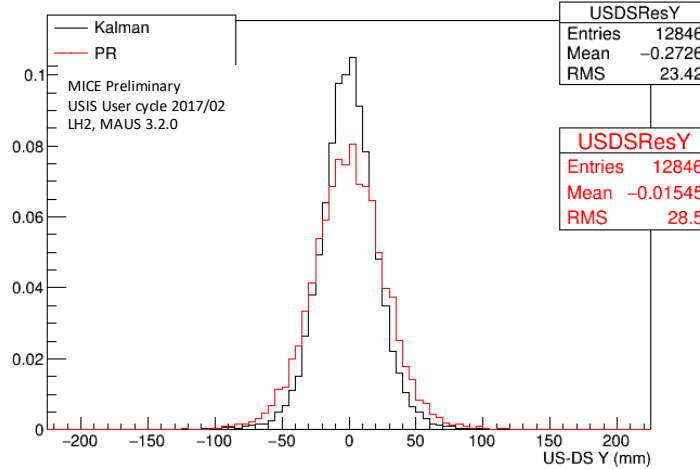


X

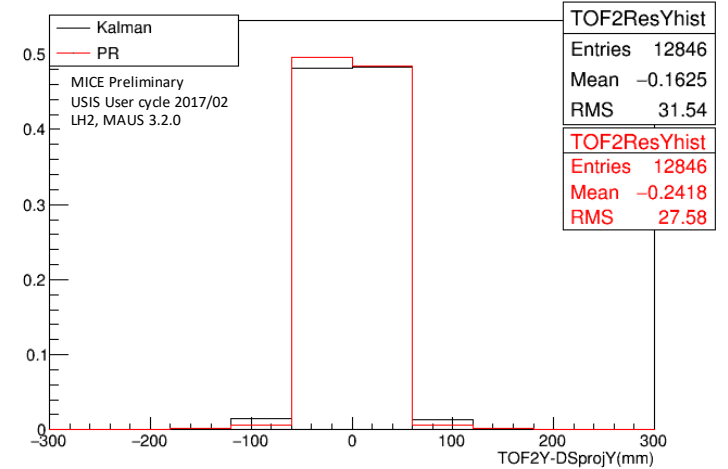
SP - proj. TOF1Y



UST-DST proj. at absorber



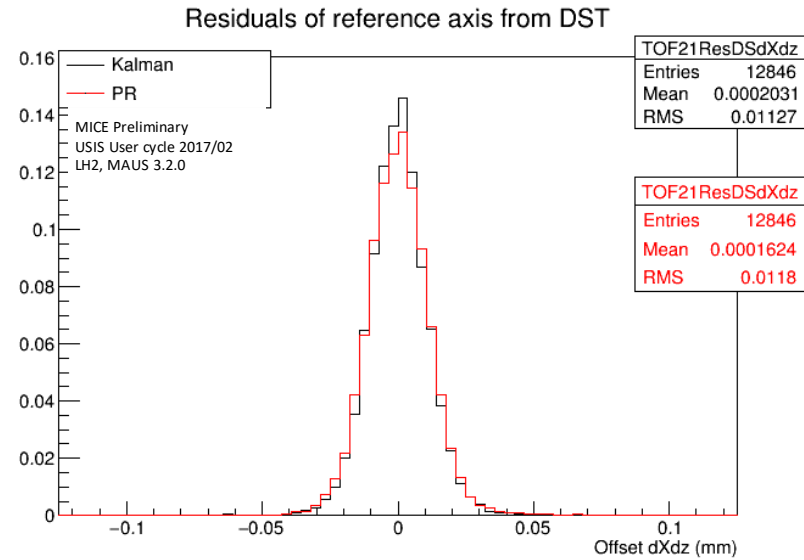
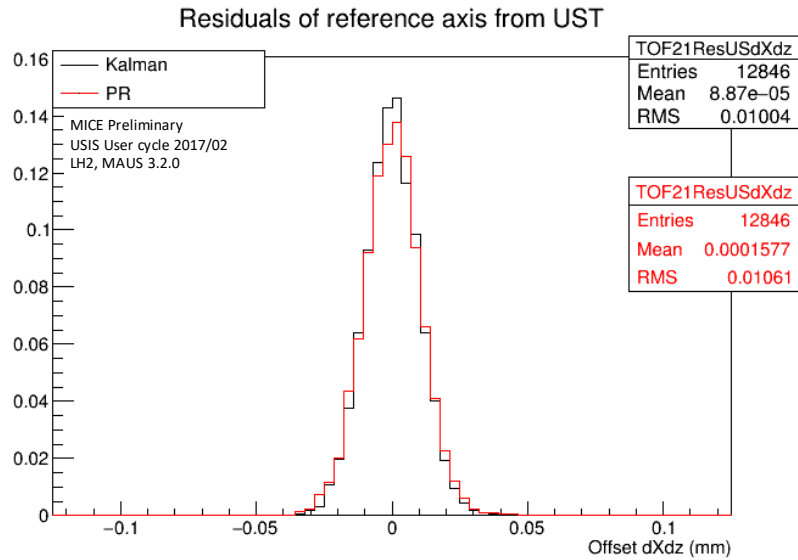
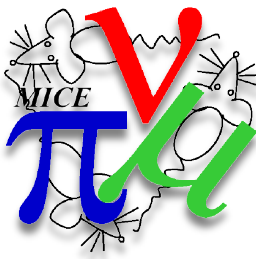
SP - proj. TOF2Y



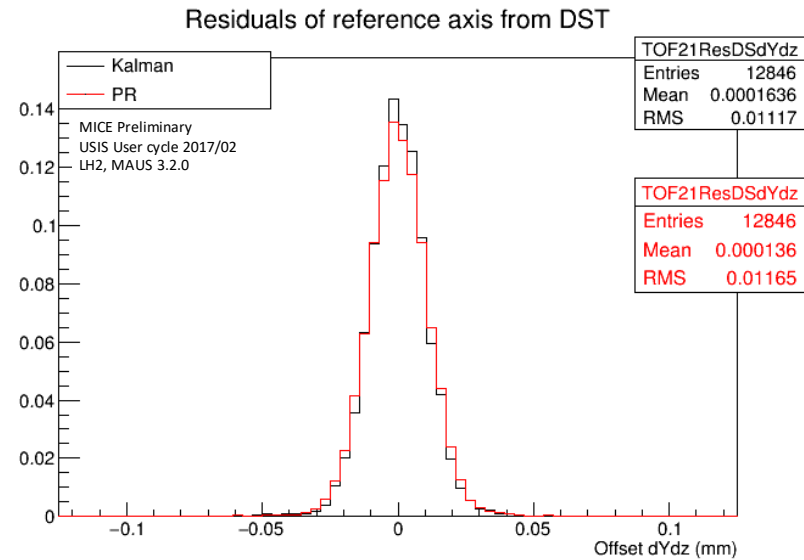
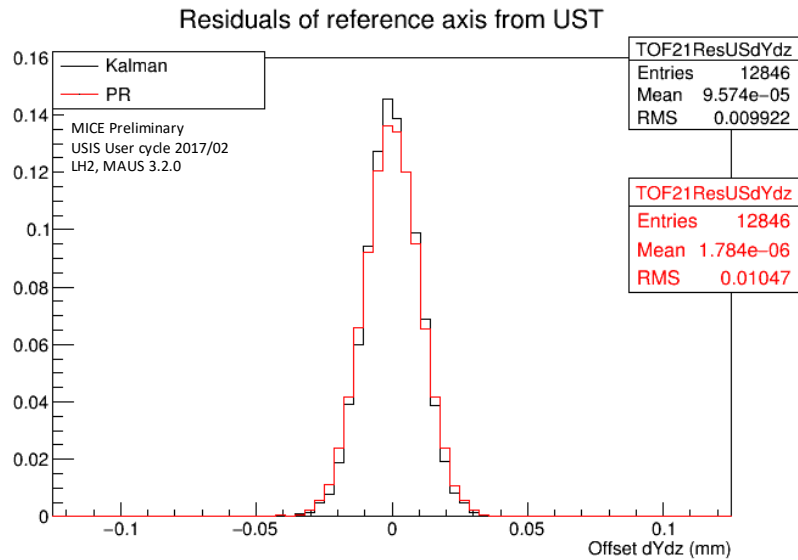
Y

MC Recon – Kalman/PR

Residuals of US & DS tracks gradients from TOF21 (reference track)

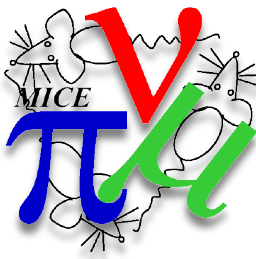


dX/dZ

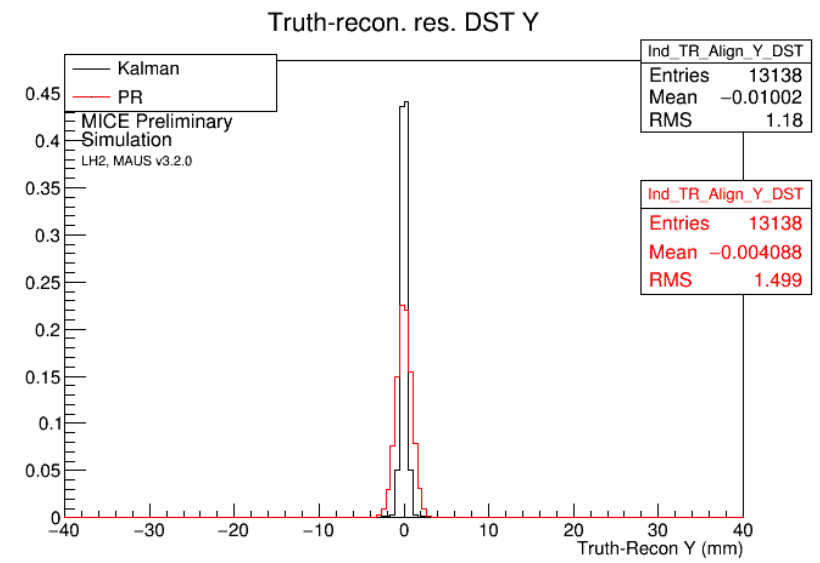
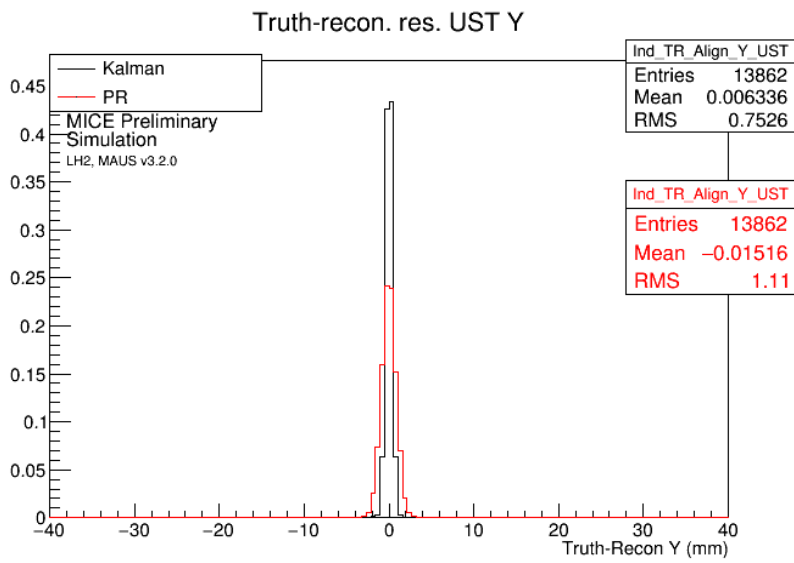
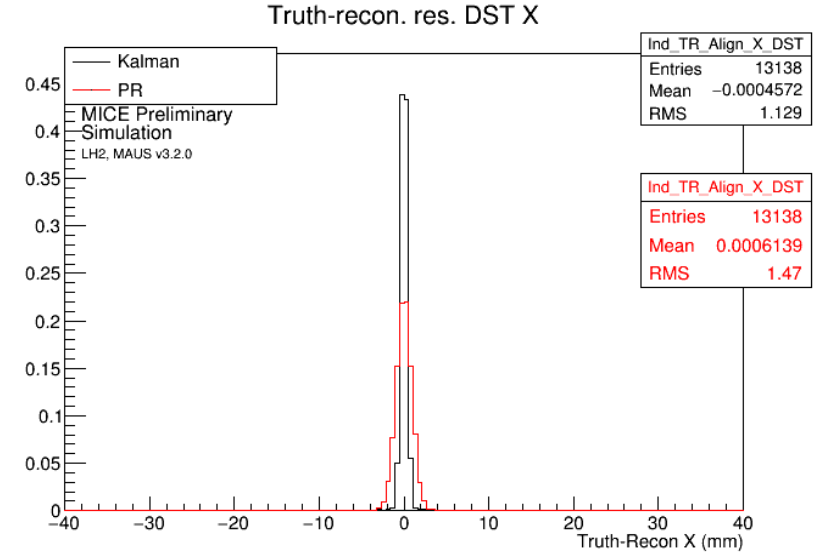
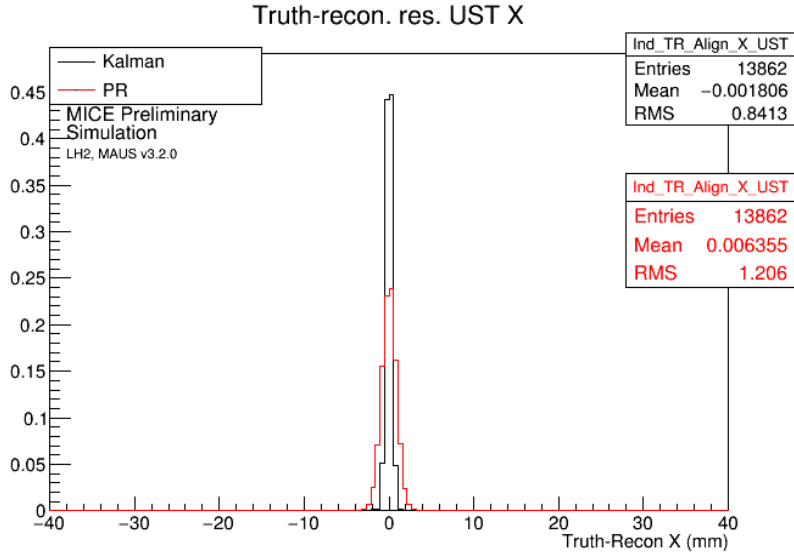


dY/dZ

MC Recon/Truth



Residuals of reconstructed SP & Truth, tracker reference planes

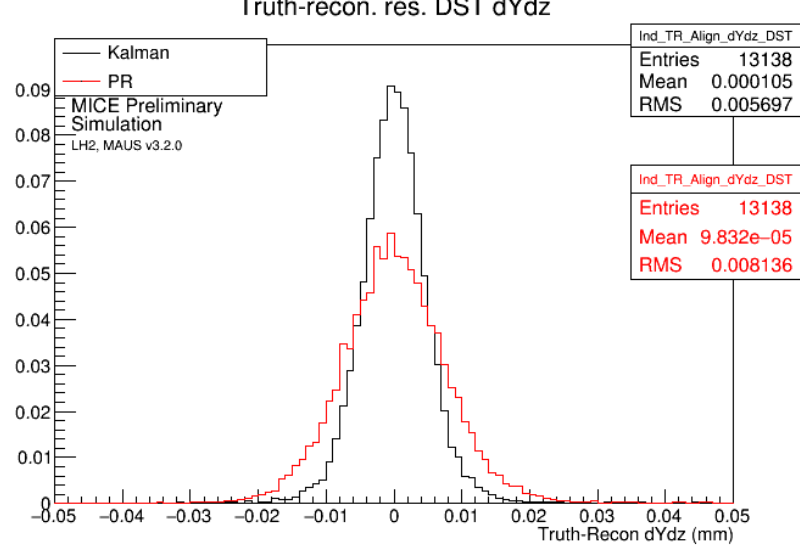
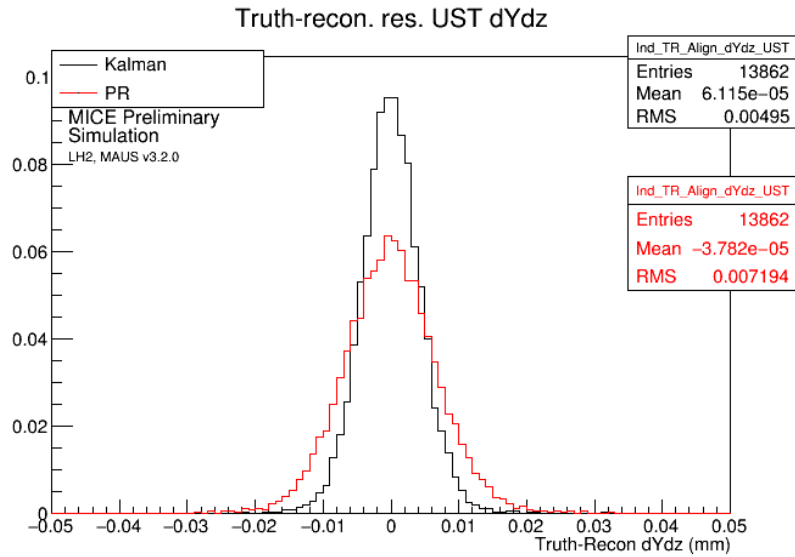
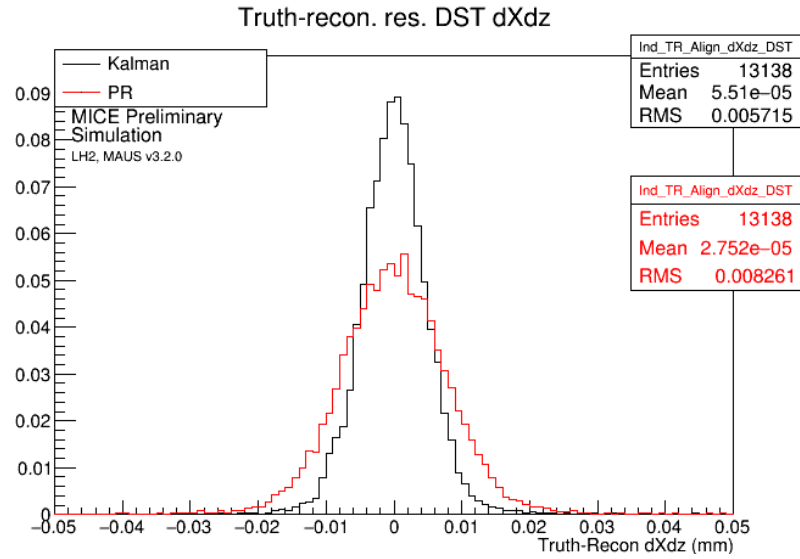
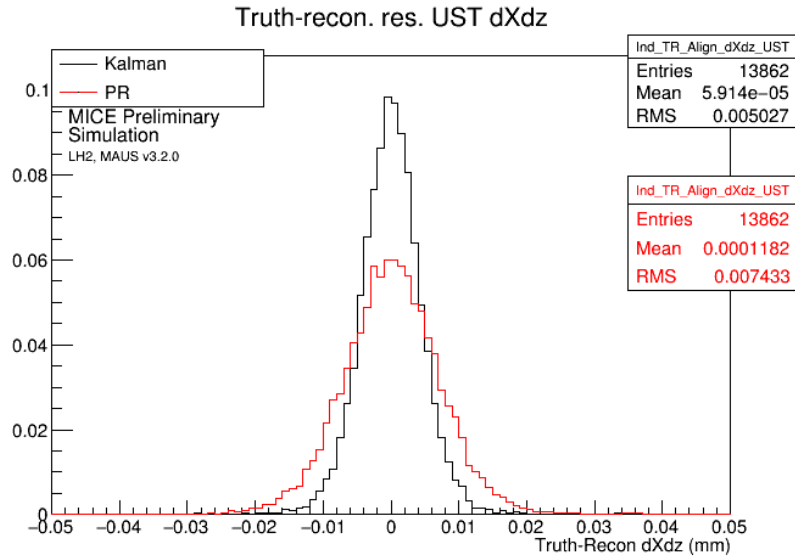
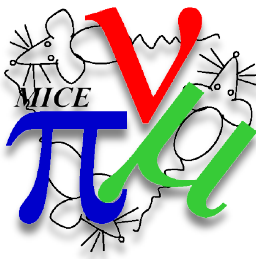


X

Y

MC Recon/Truth

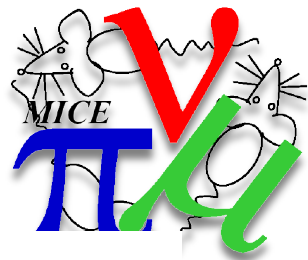
Residuals of reconstructed SP & Truth, tracker reference planes



X

Y

Conclusion



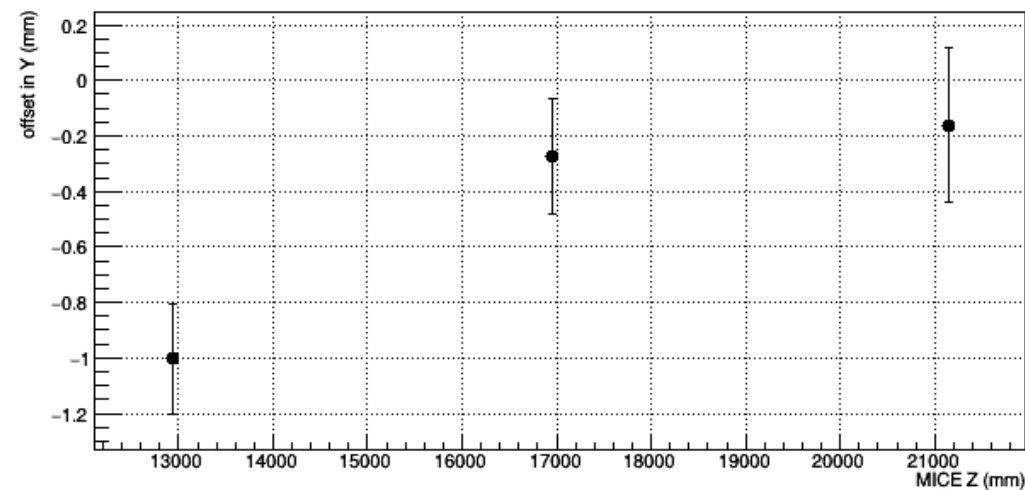
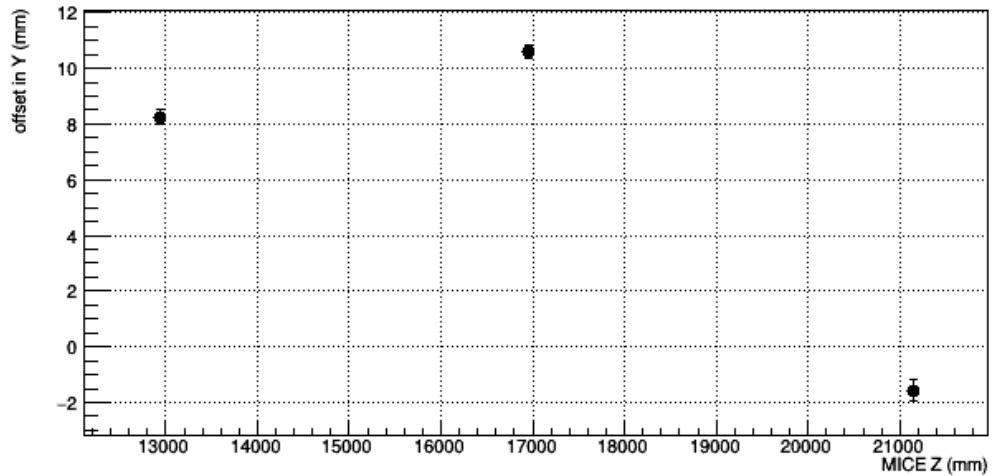
Data

Mean of residuals, Y

MC Recon

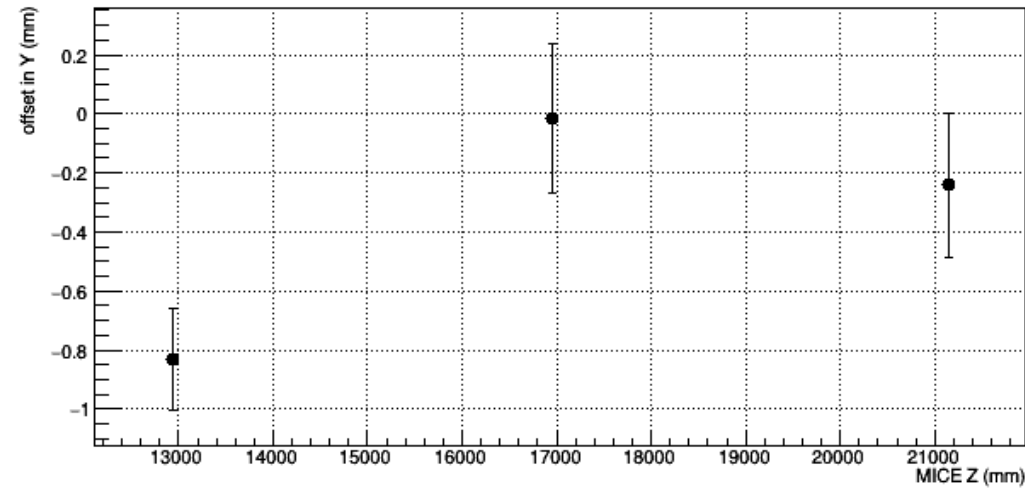
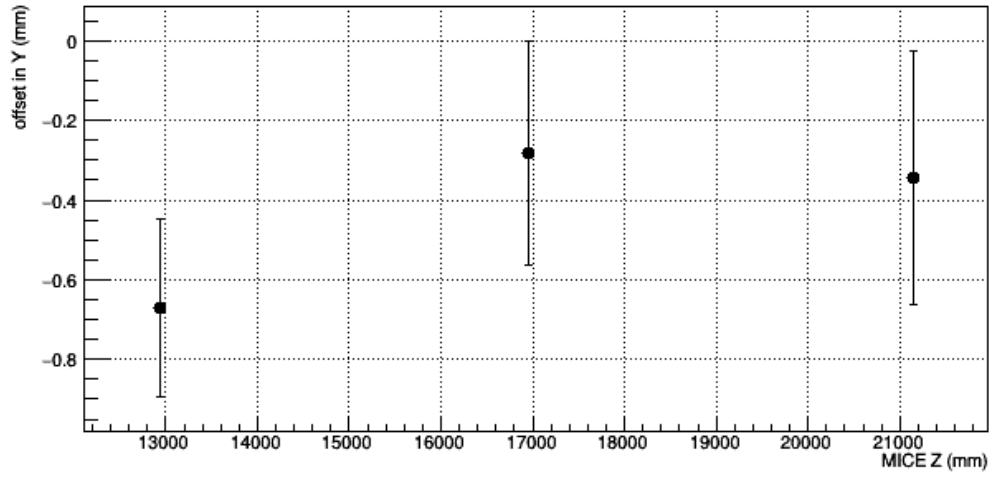
Alignment Y, Spatial

Alignment Y, Spatial



Alignment Y, Spatial

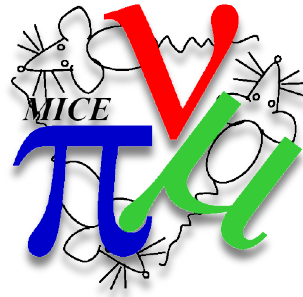
Alignment Y, Spatial



Kalman

PR

Plan



- Alignment:
 - Investigate why the two straight track algorithms perform different in MC & Data reconstruction
- MCS Analysis
 - Currently thinking/gathering discriminators for PID &
 - Reading through ROOT MVA methods
 - Momentum accuracy and ability to predict momentum evolution through the lattice is critical for PID