System performance paper
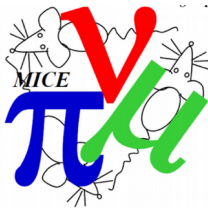
P. Franchini

Status of the paper

- Recently included
  - Tracker section
  - Liquid hydrogen absorber studies

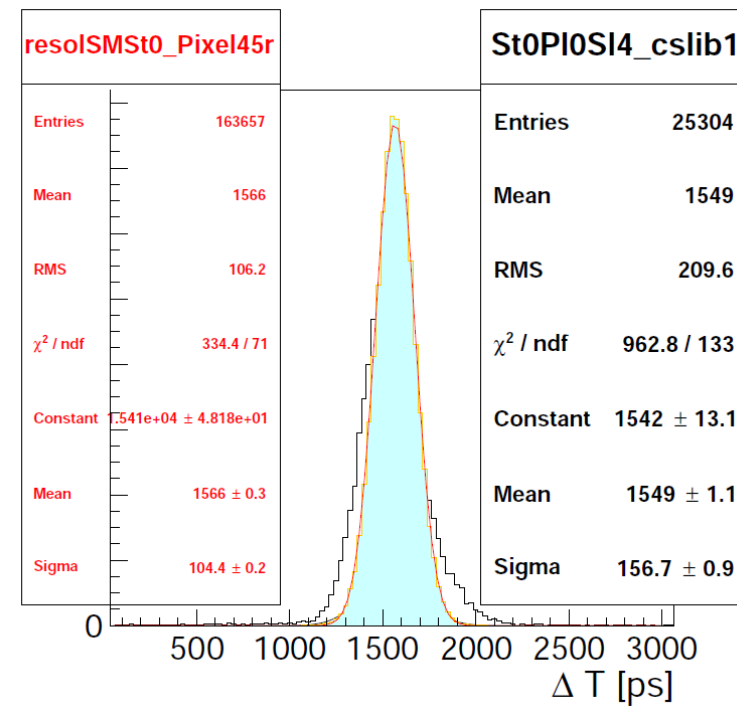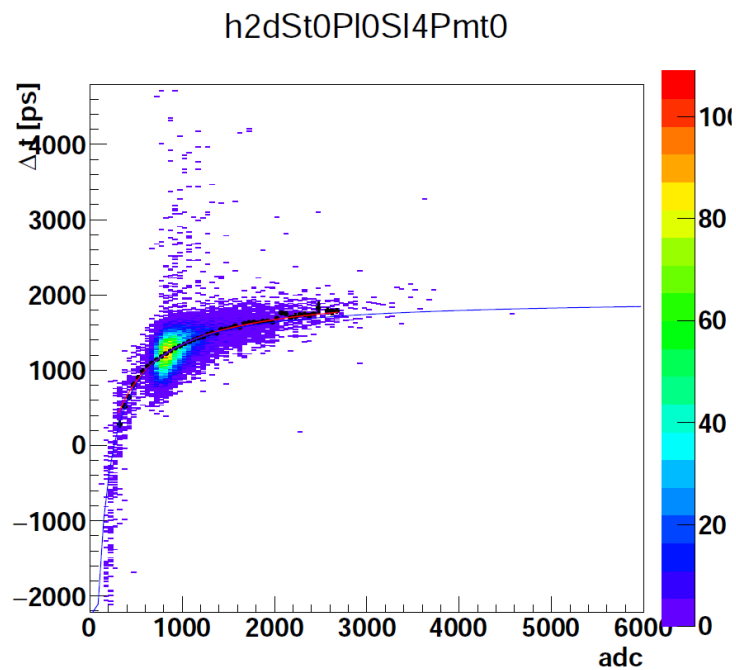- PID is incomplete

- Missing the energy loss
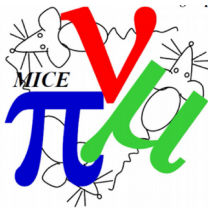
TOF

- Calibration method

- Corrections

  - Time walk correction

  - Trigger delay correction

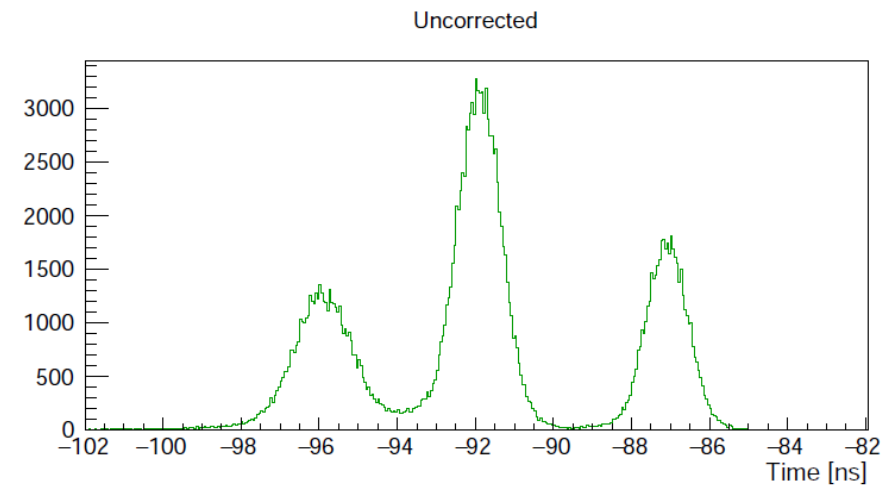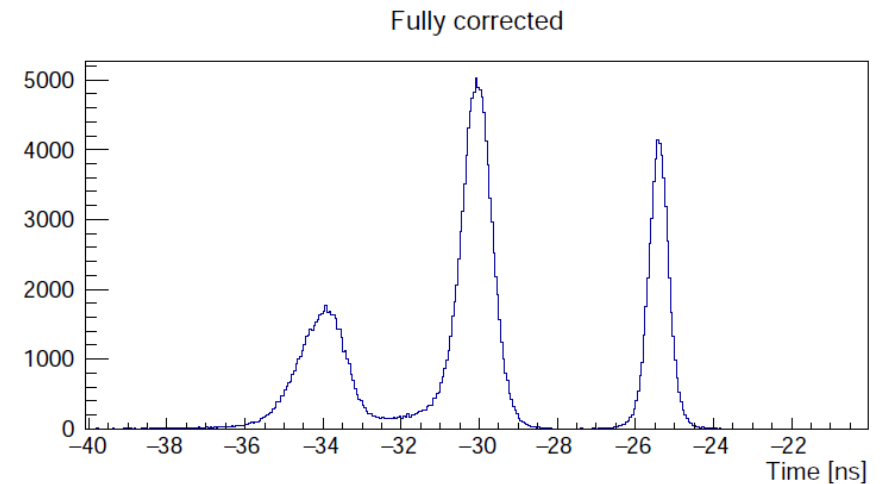 - PMT channel specific delay time

- Performance

TOF

- Time walk correction
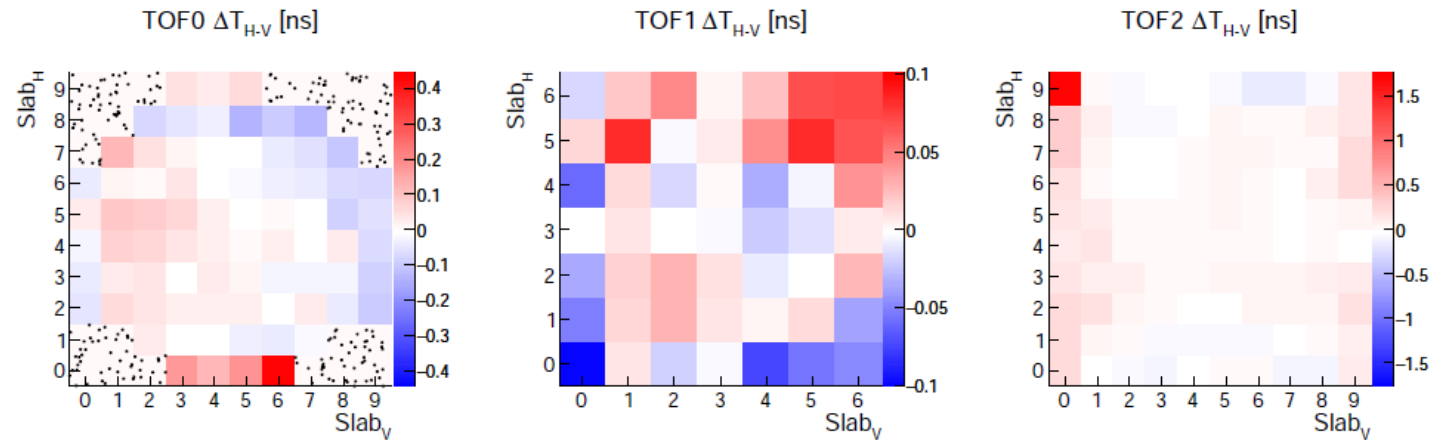 - Δt between horizontal and vertical slabs

TOF

- PMT channel specific delay time

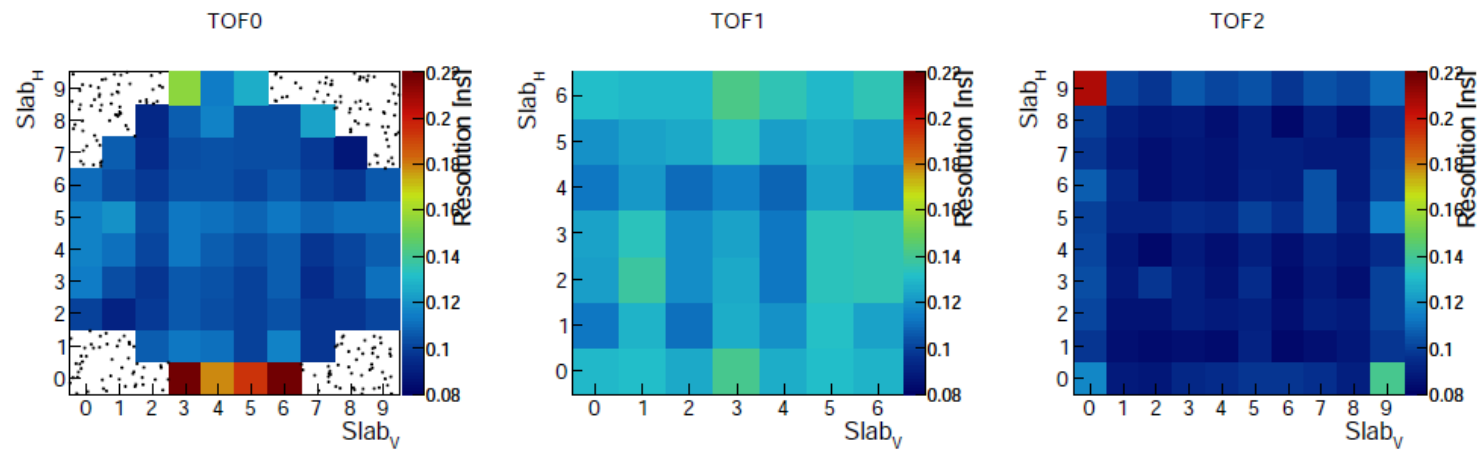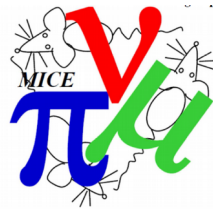- Time distribution in TOF0 after and before the corrections

TOF

- Offset in slab DT

- Spread in slab DT

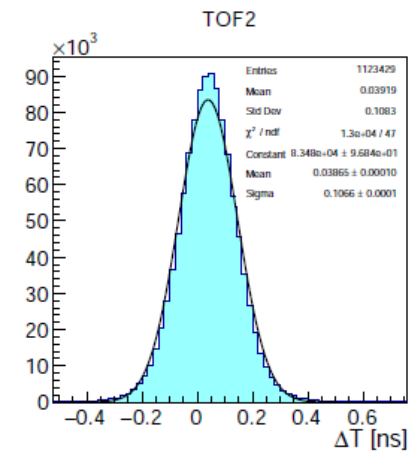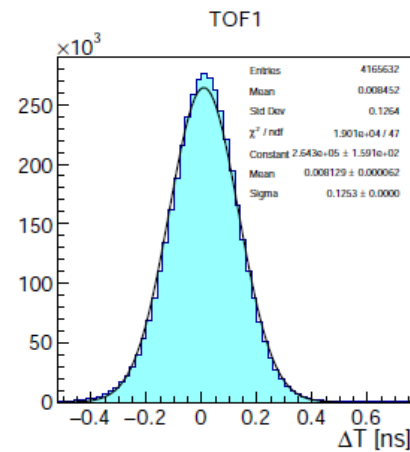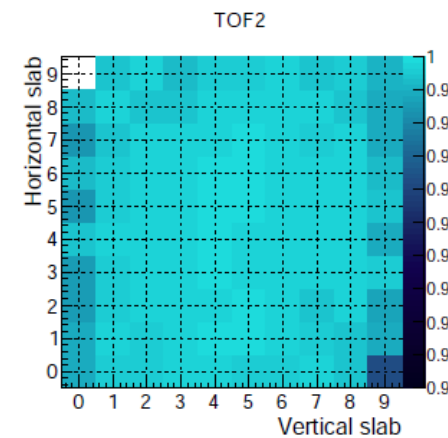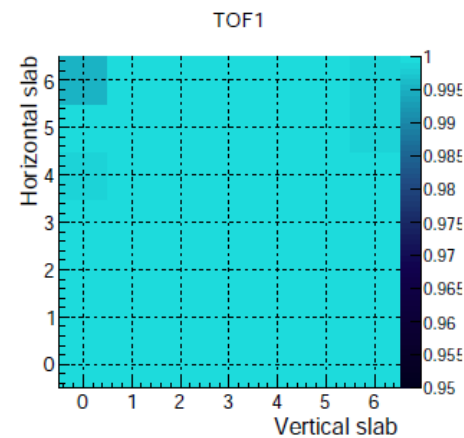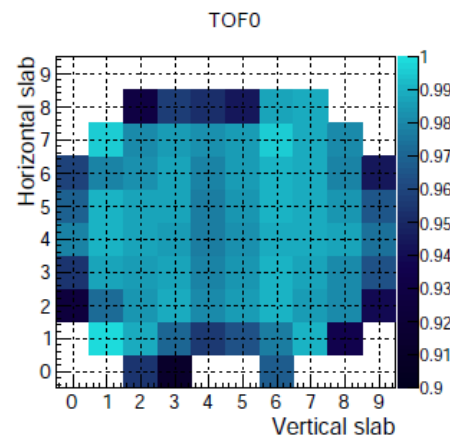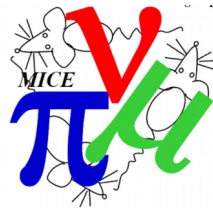# TOF

- Overall DT distributions
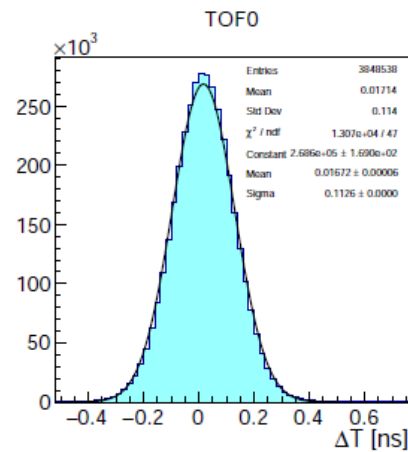
- Efficiency of sp creation
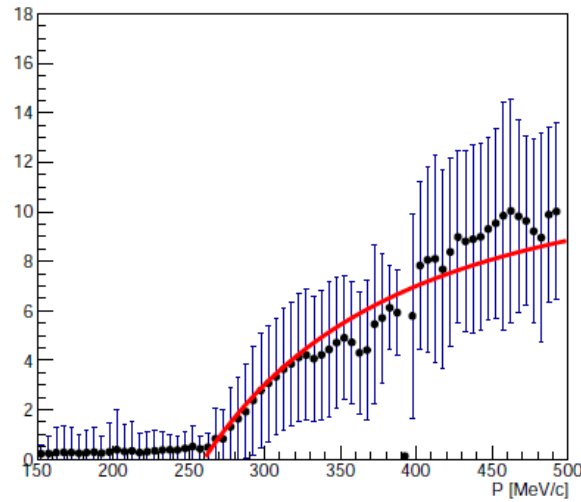
Cherenkov
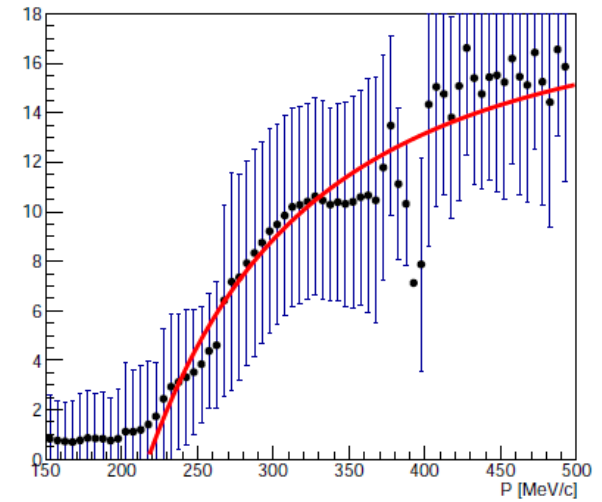
- PE yields
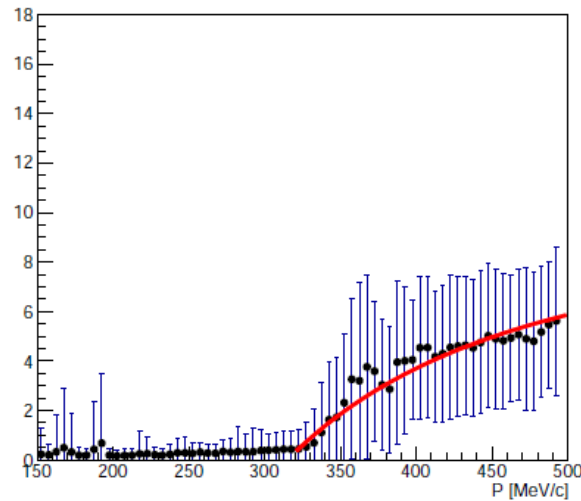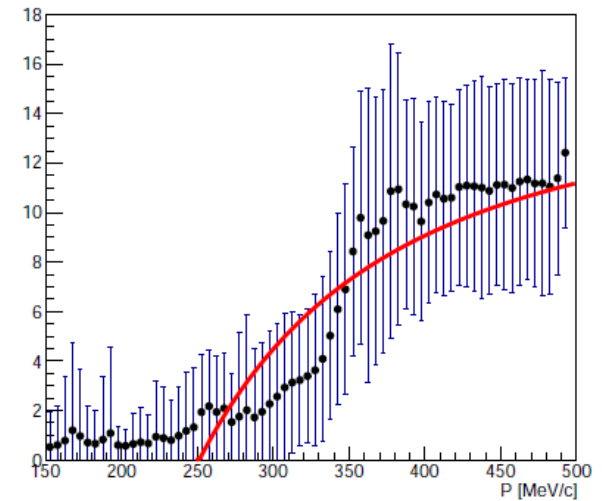
KL

- ## Response for different P
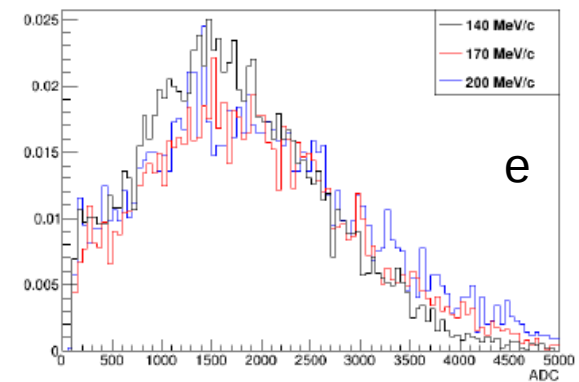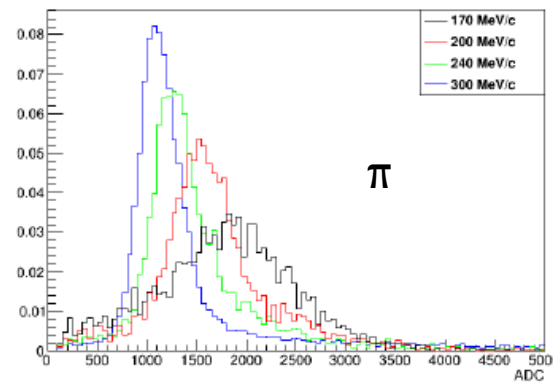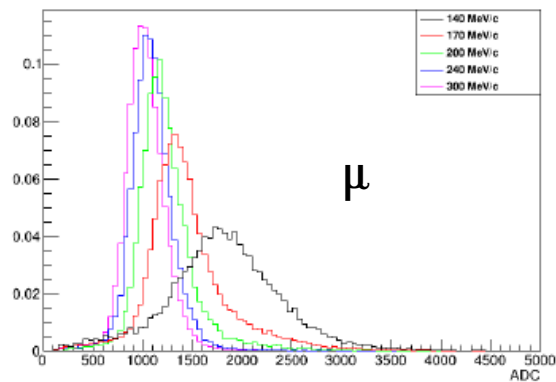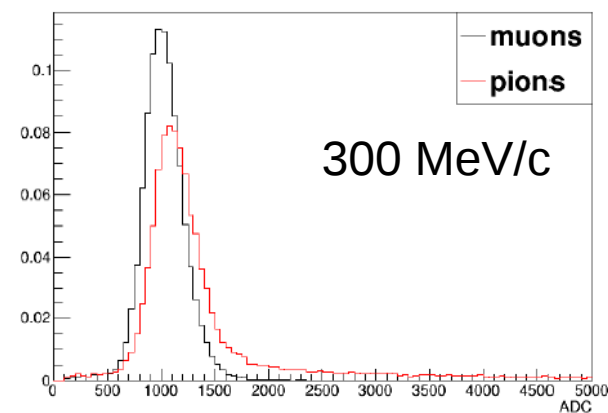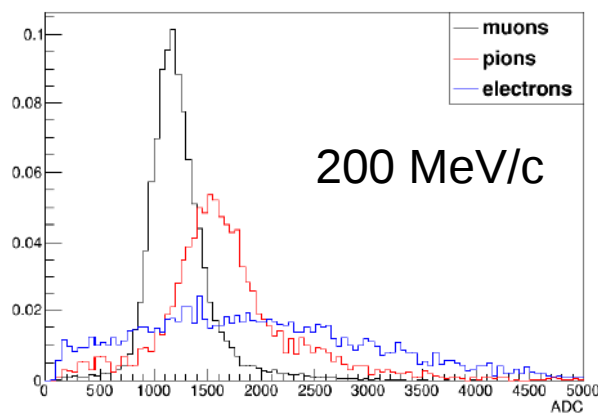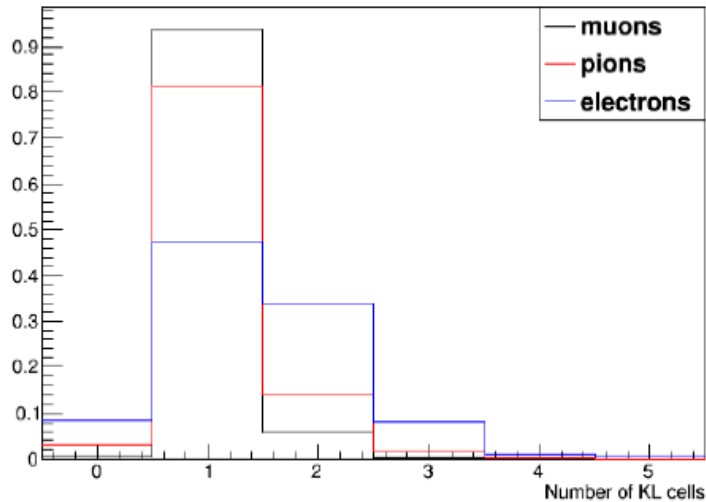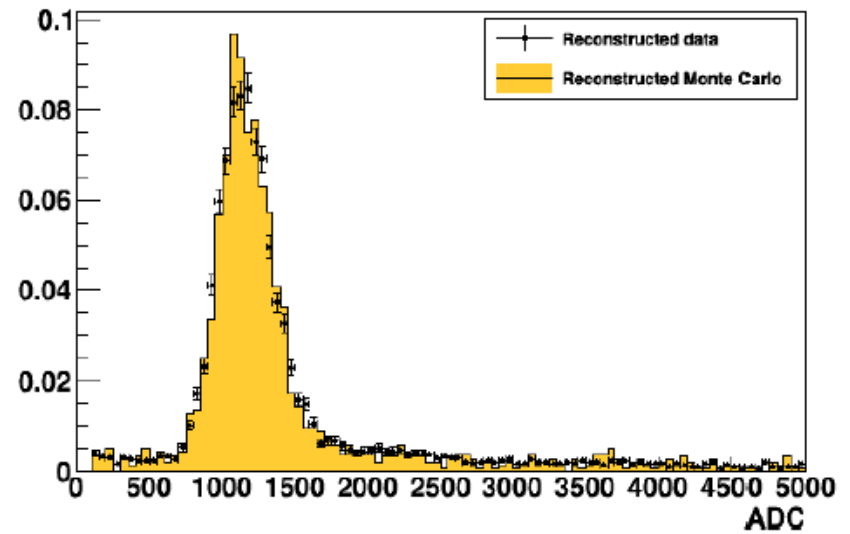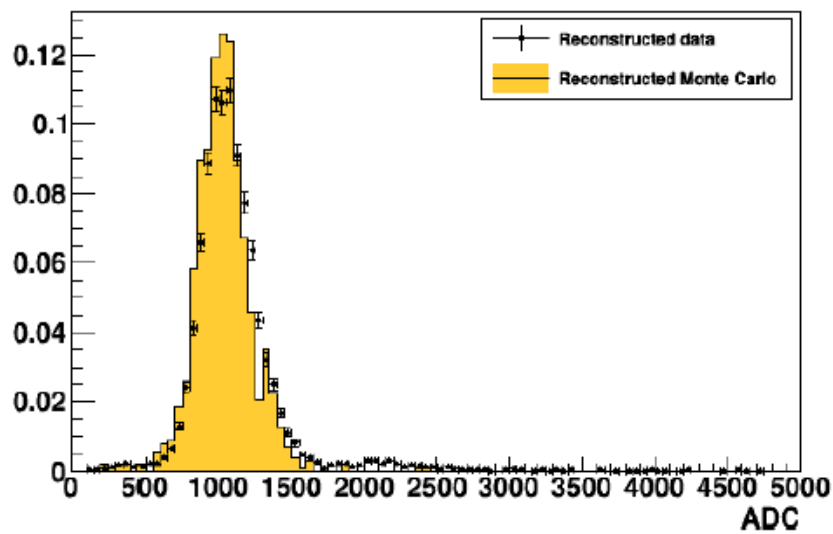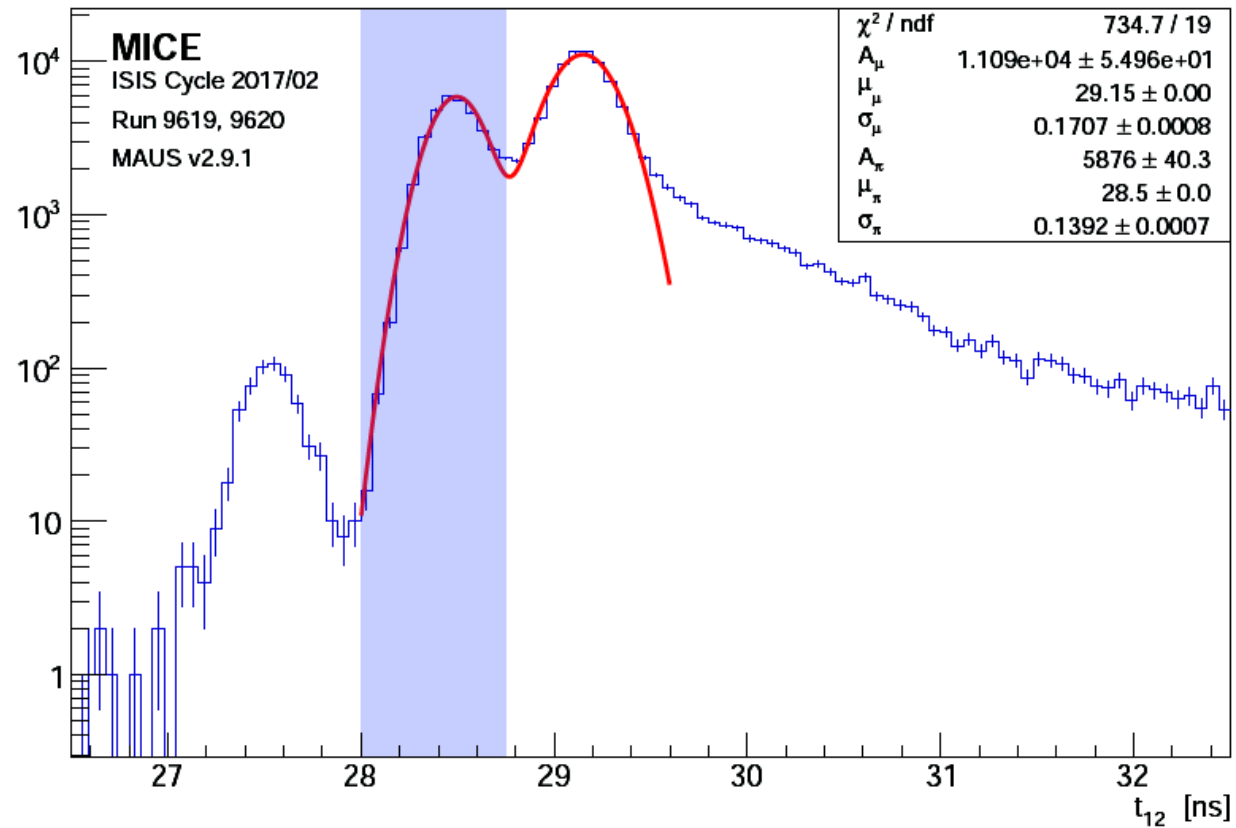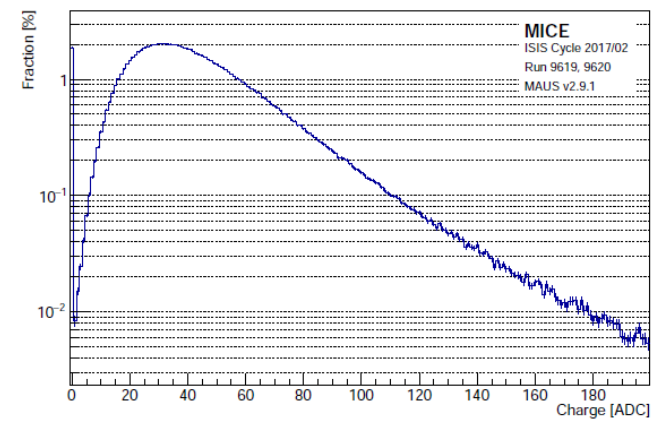

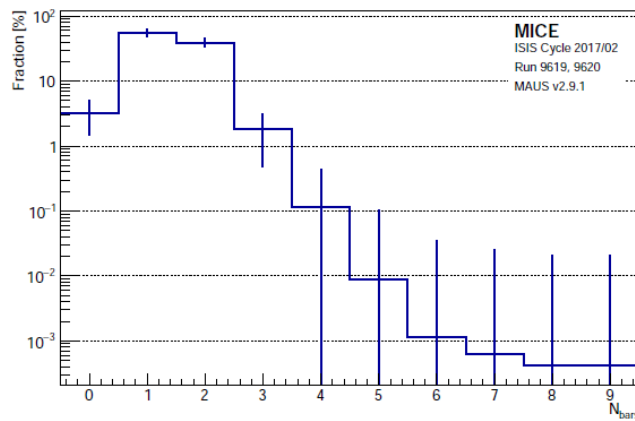- ## Response for different species

KL

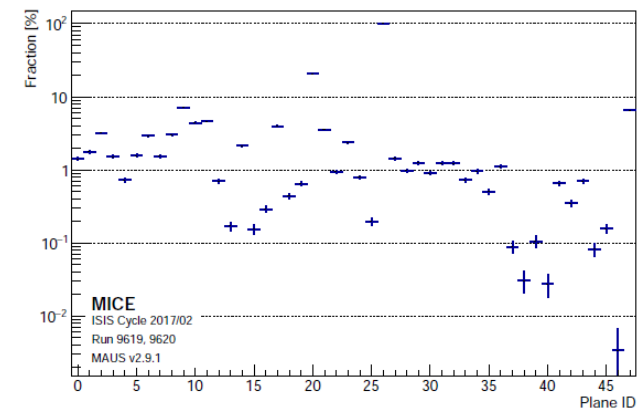- ## Multiplicity

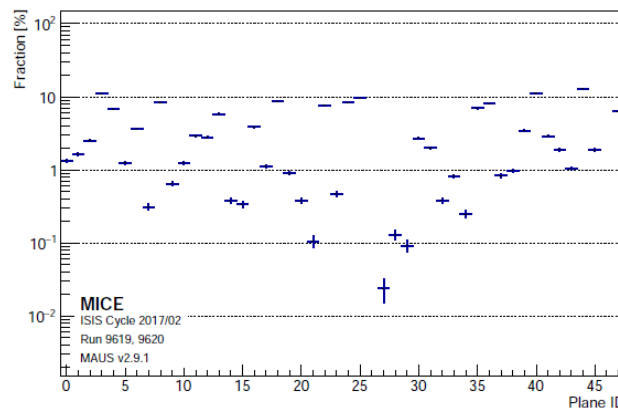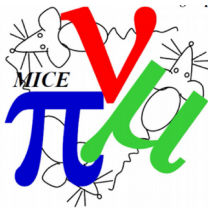- ## Data vs MC

EMR

- 400 MeV/c pionic beam

EMR

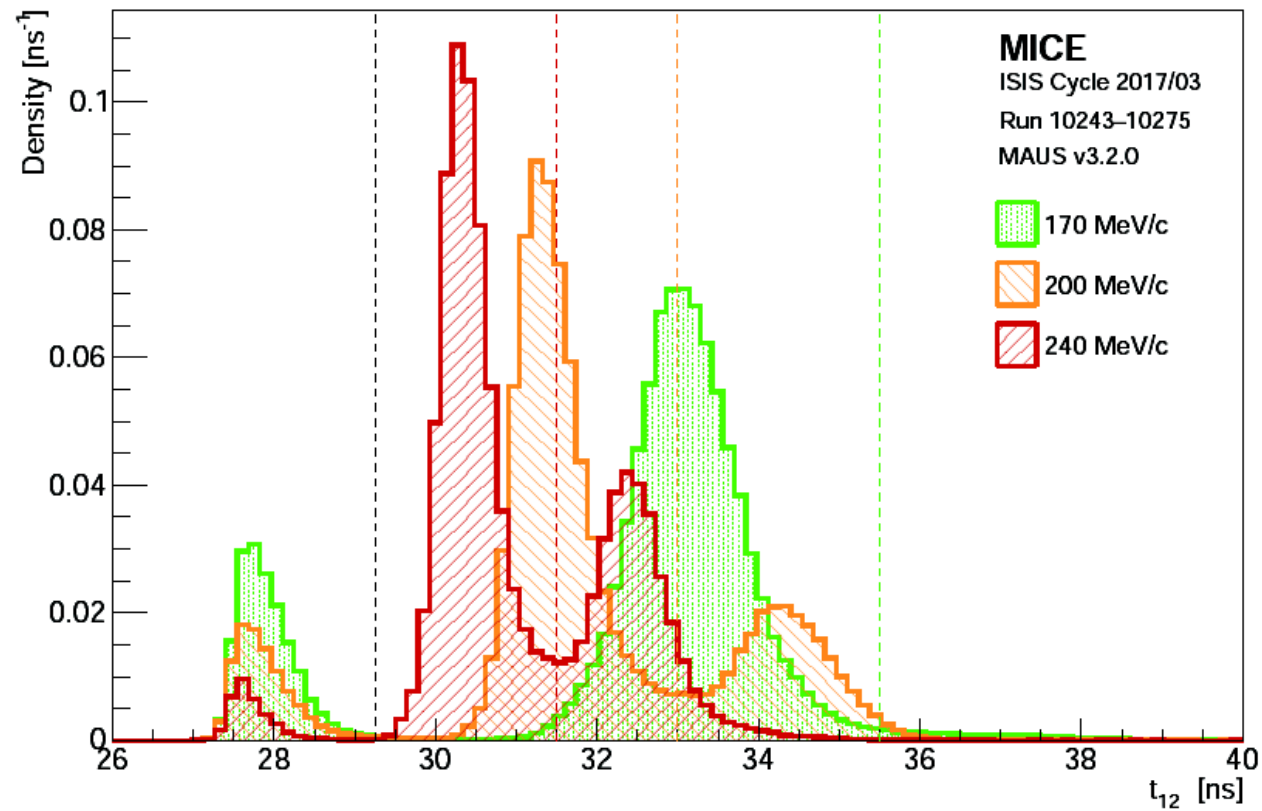- MAPMT bar multiplicity / SAPMT charge distribution
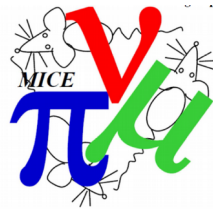

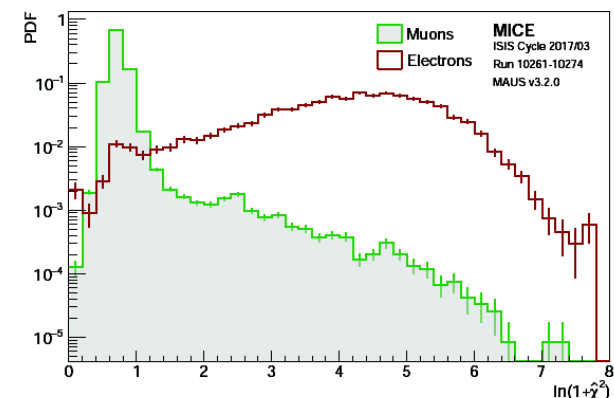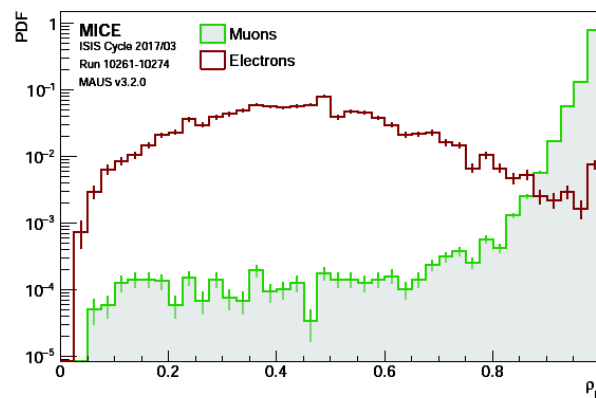- Probability of not producing a single hit / zero charge

EMR

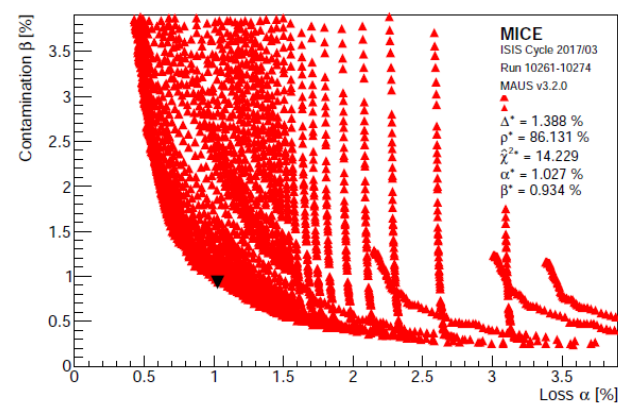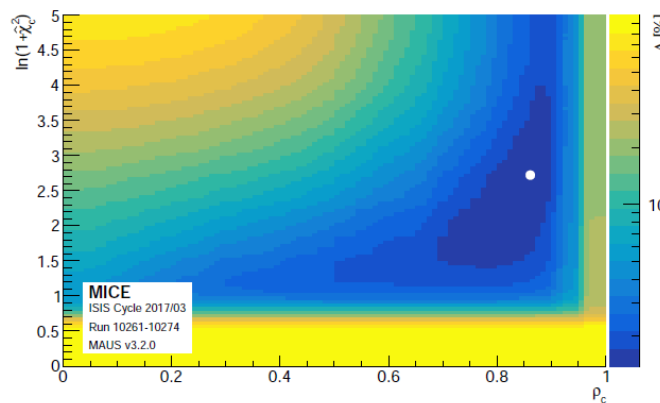- Datasets for the EMR performance analysis

EMR

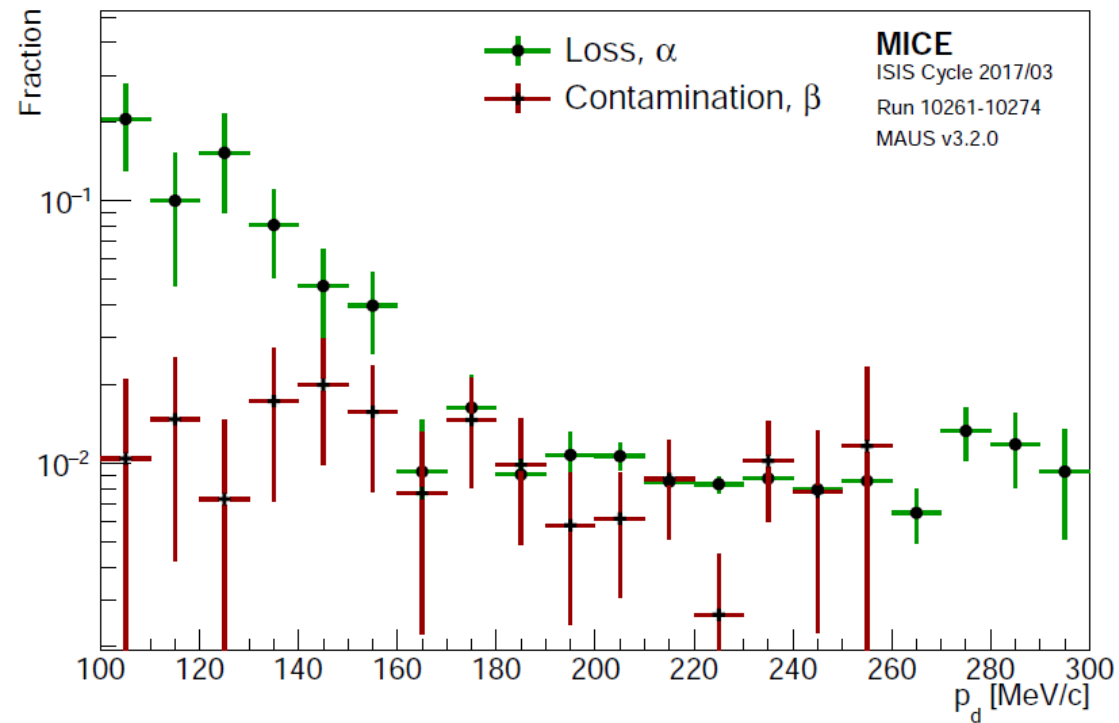- PID variables: plane density and chi2

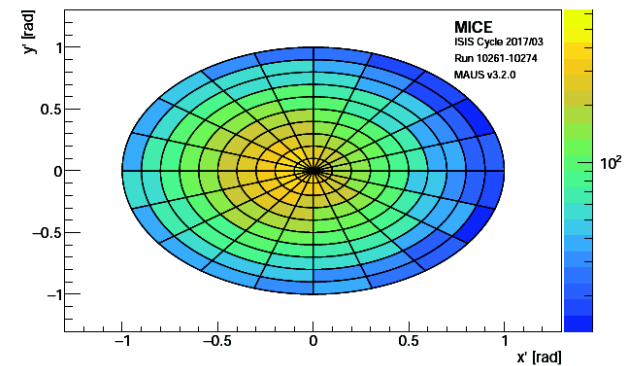- Cost function and *e* tagged as μ as function of the loss of real muons
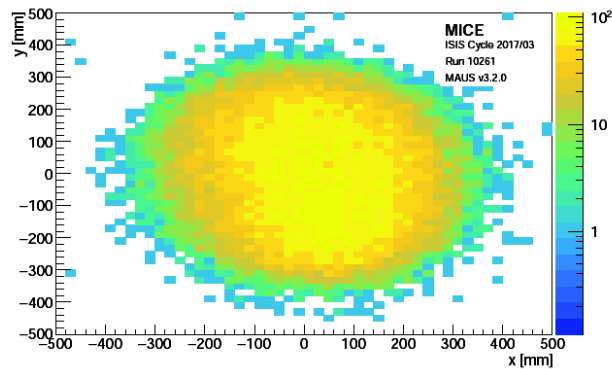
EMR

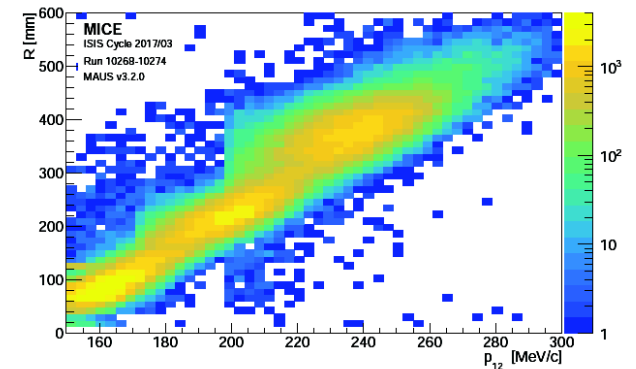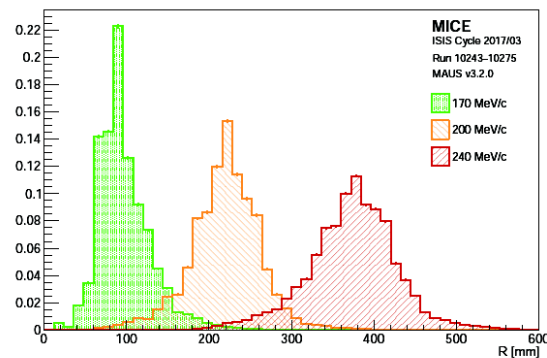- Electron contamination and muon loss vs P
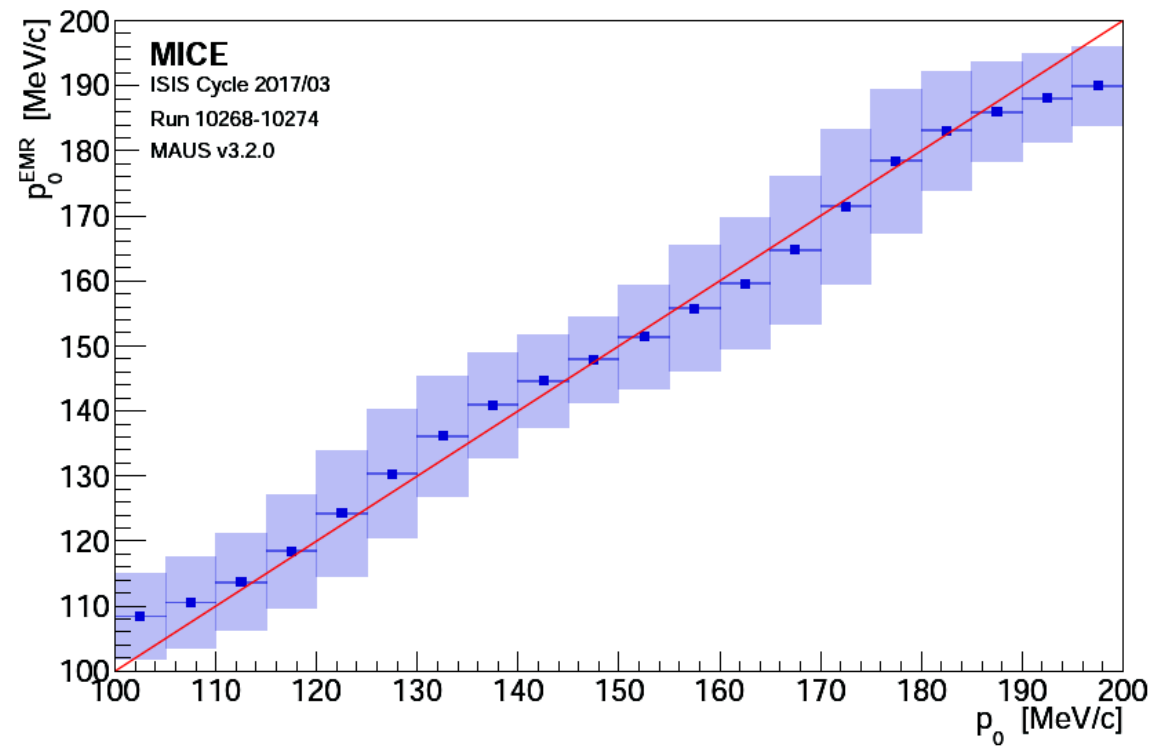
EMR

- Beam profile and track gradients

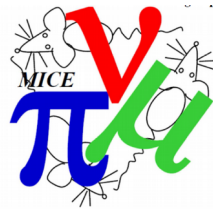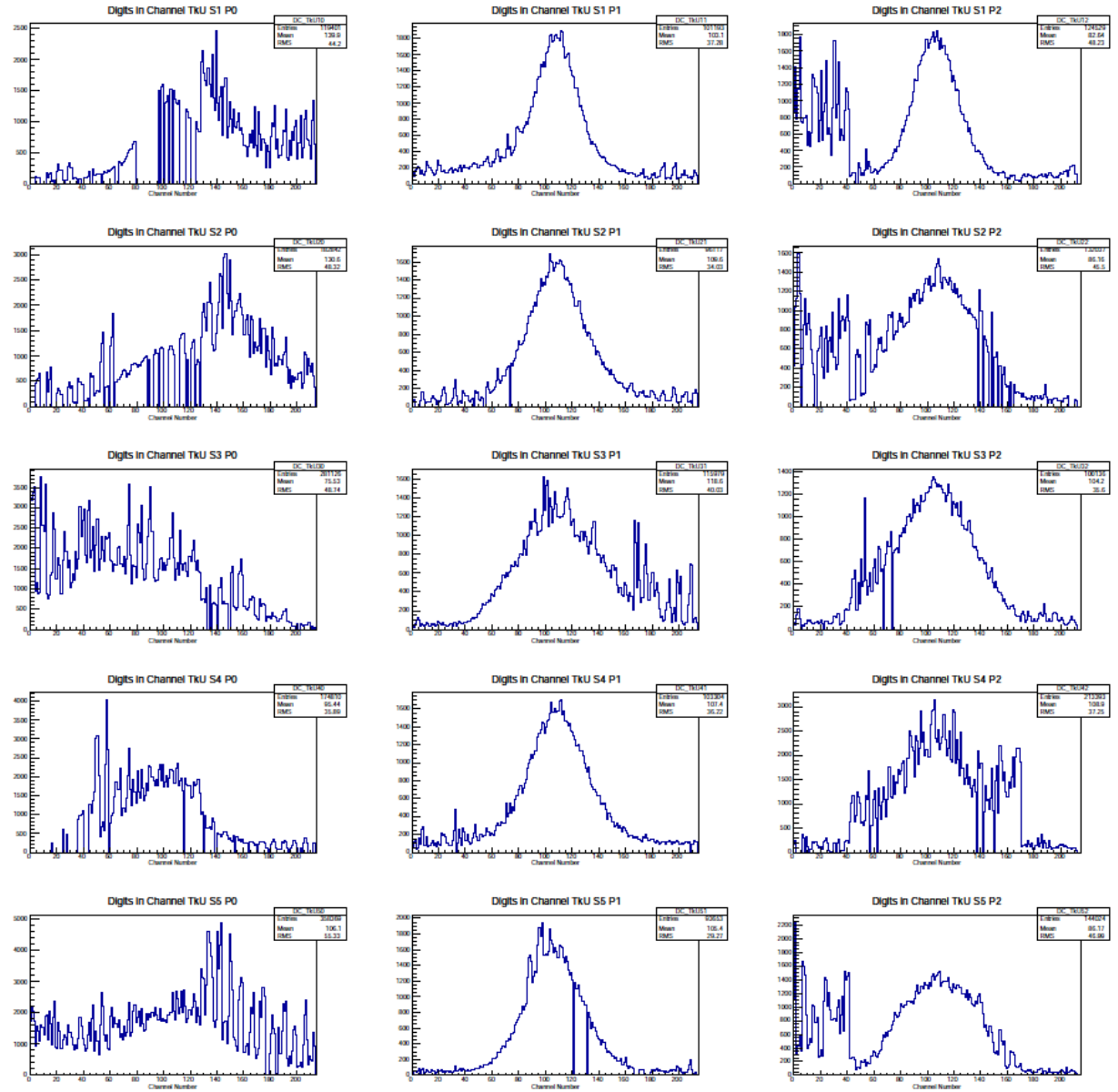- Range distribution and range vs TOF12

EMR
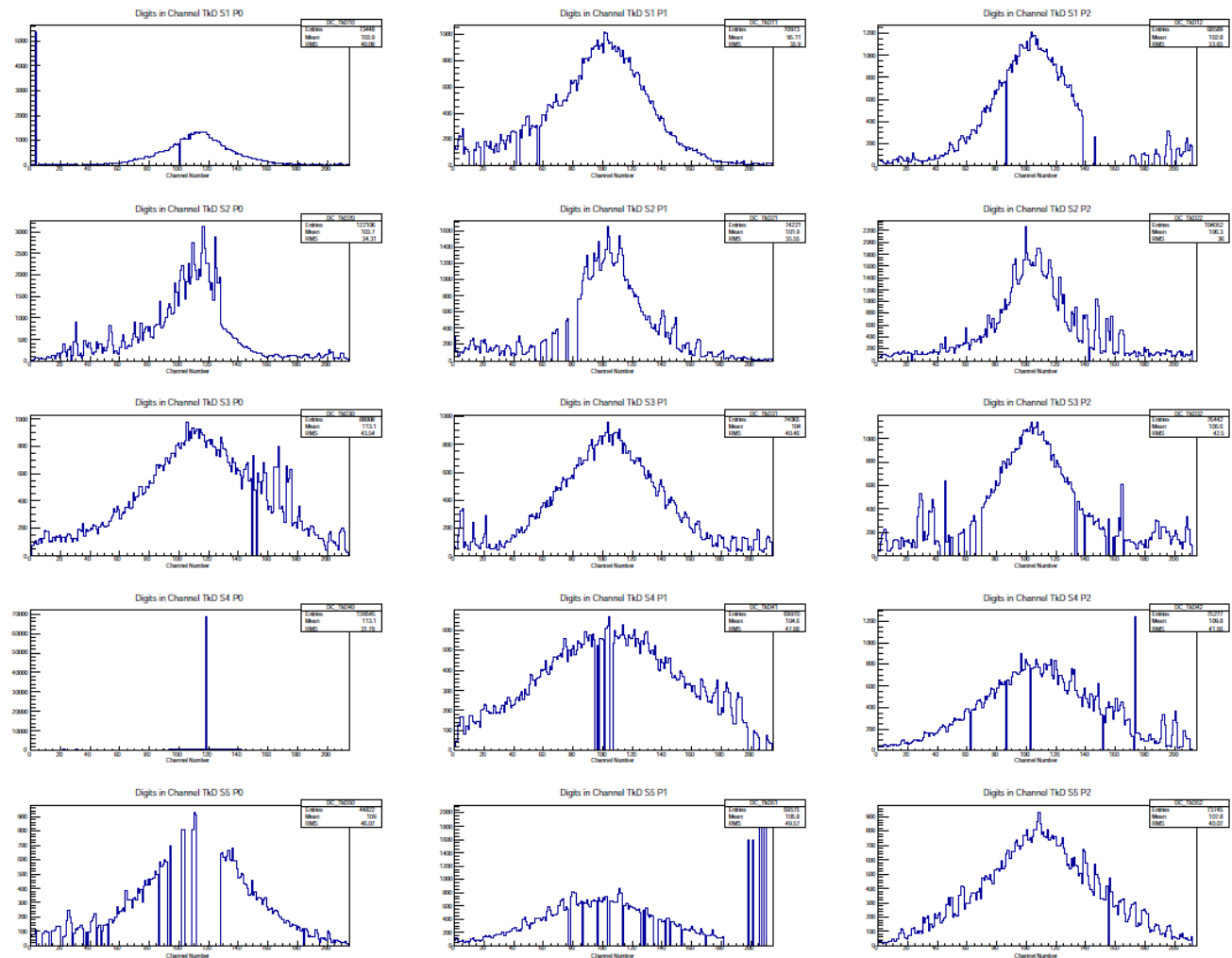
- Momentum reconstructed from the range (CSDA)
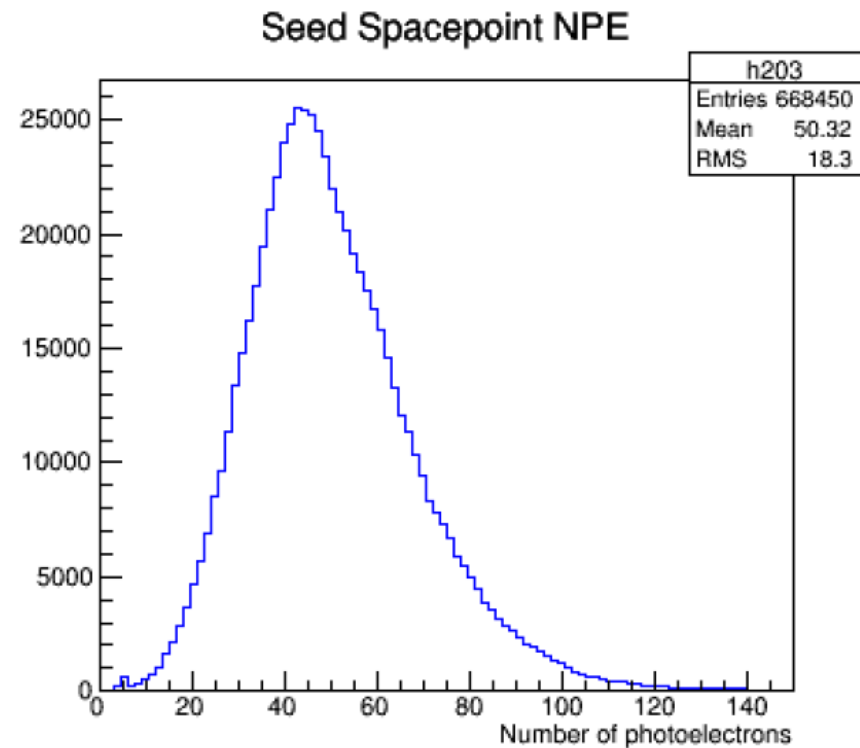
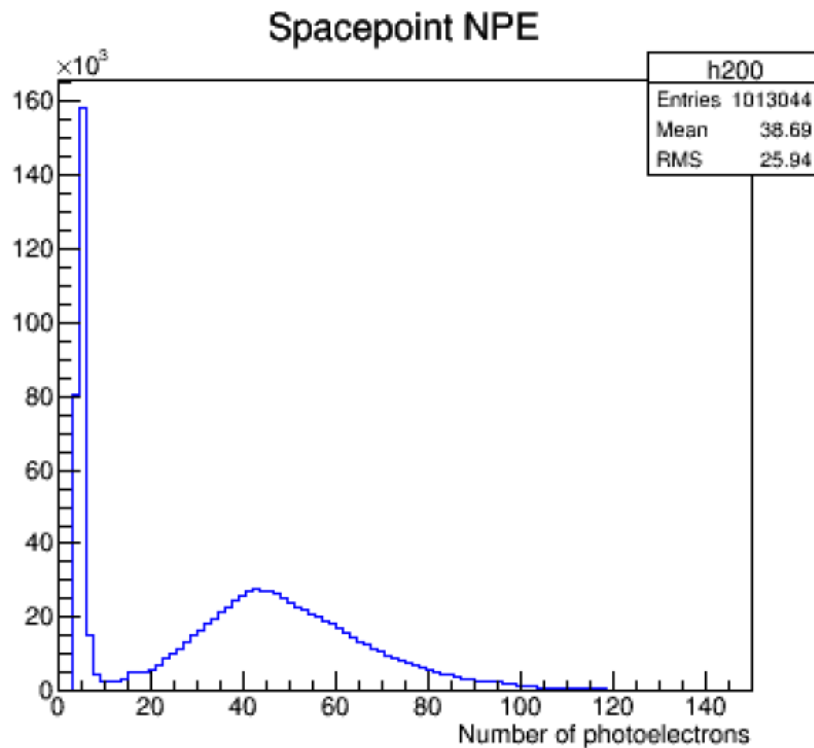# Trackers

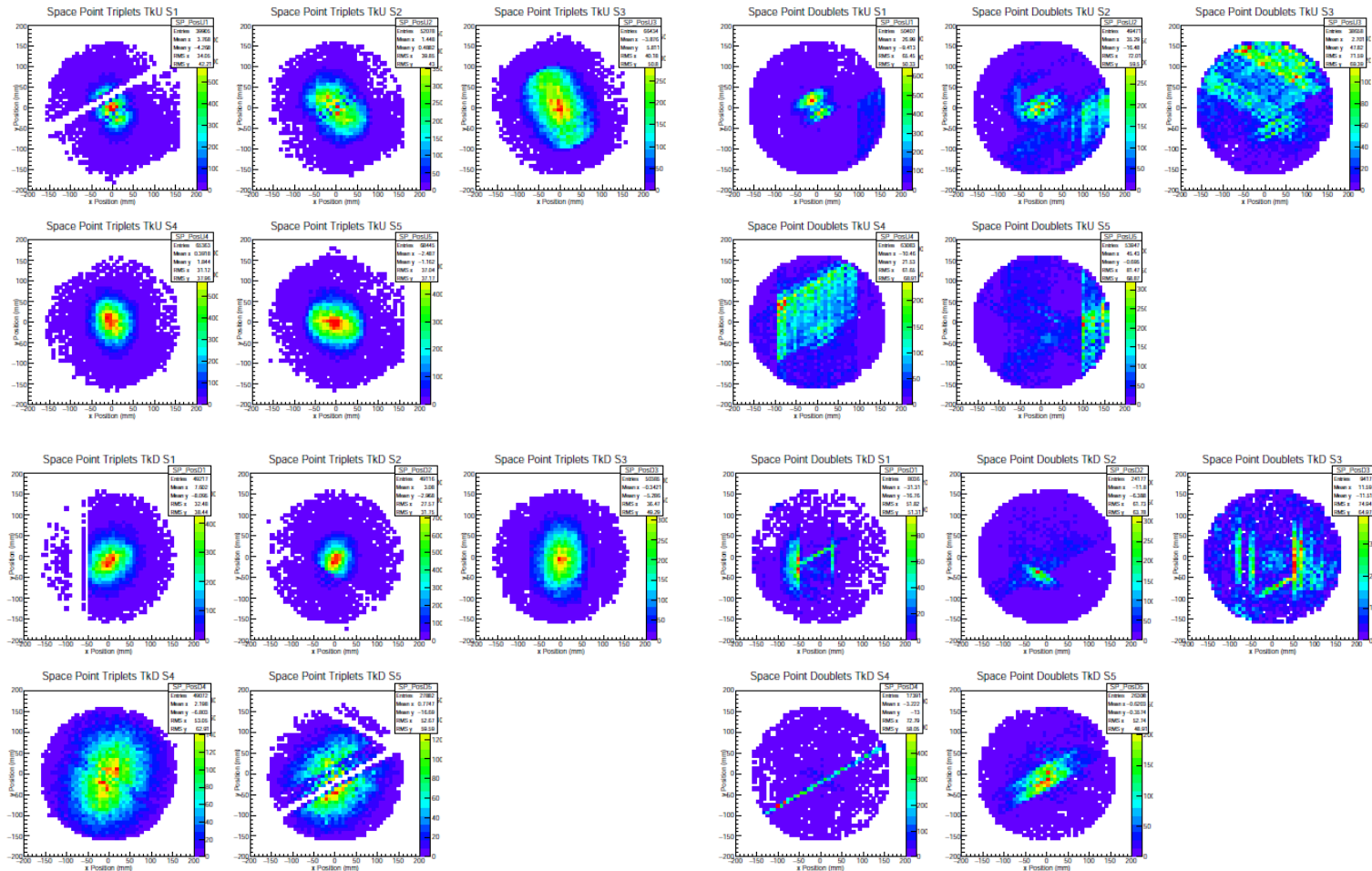- Digit profiles in TKU

Trackers

- Digit profiles in TKD
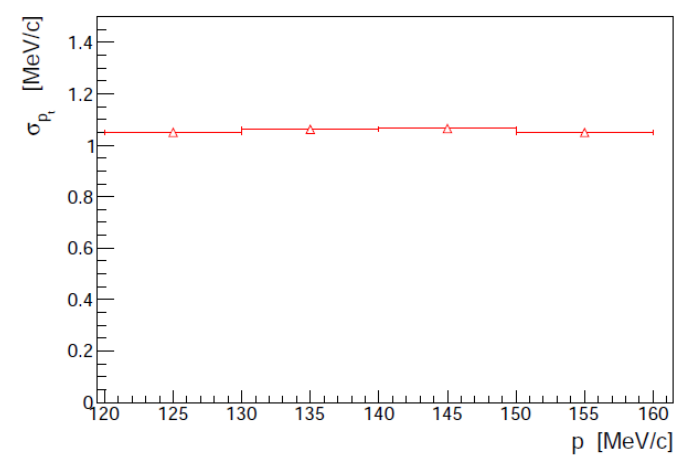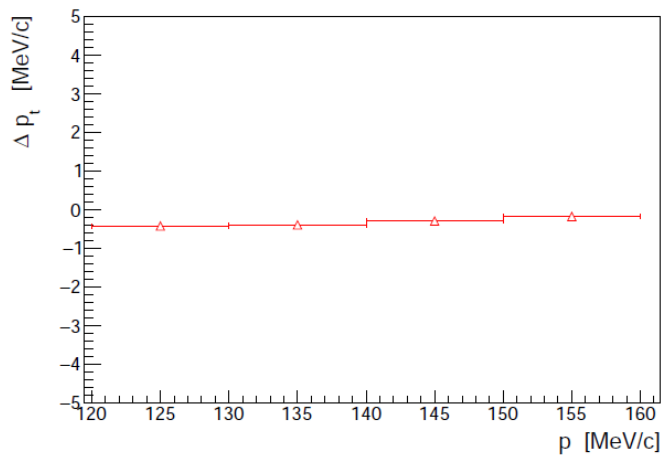
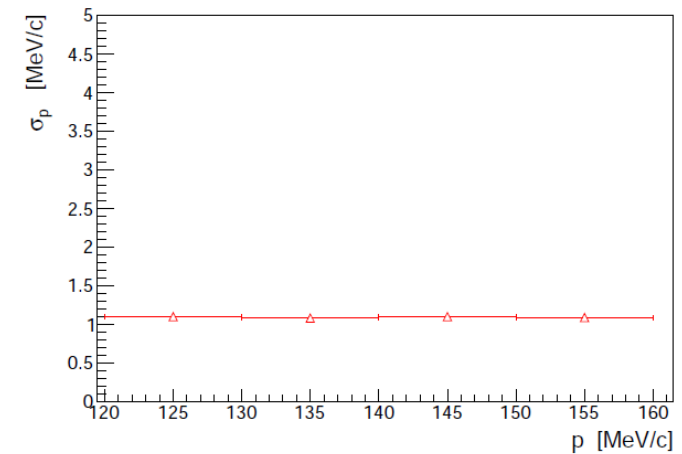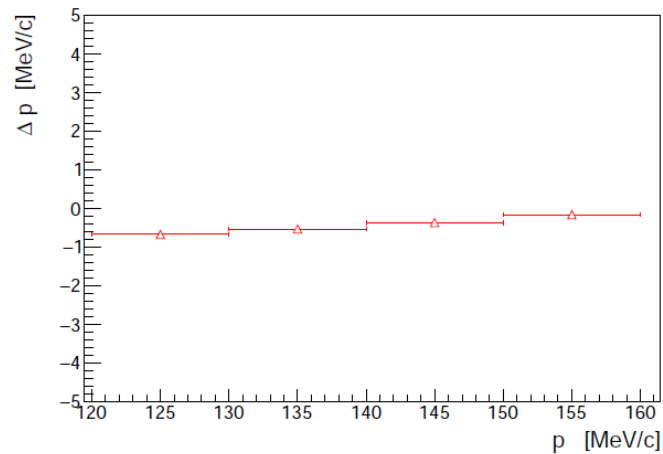# Trackers

- Space points and space points used for tracks

Trackers

- Triplets and doublets space points

Trackers

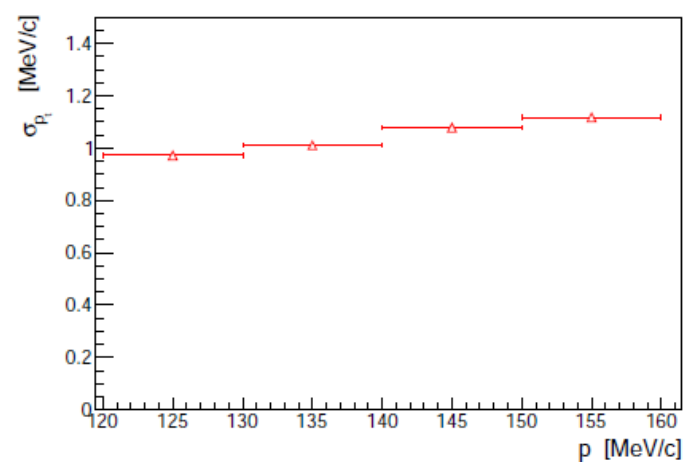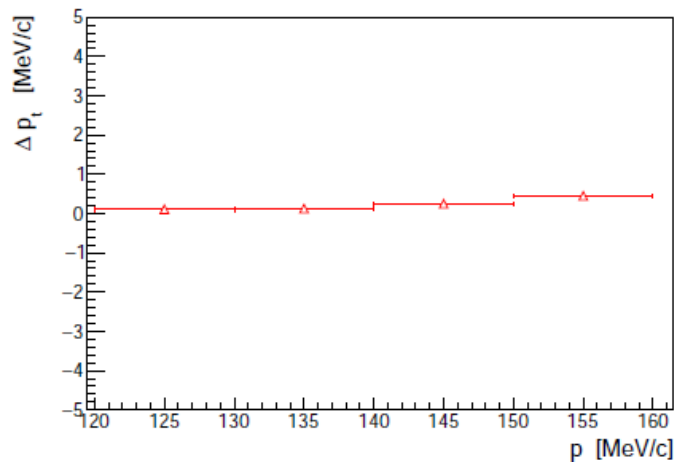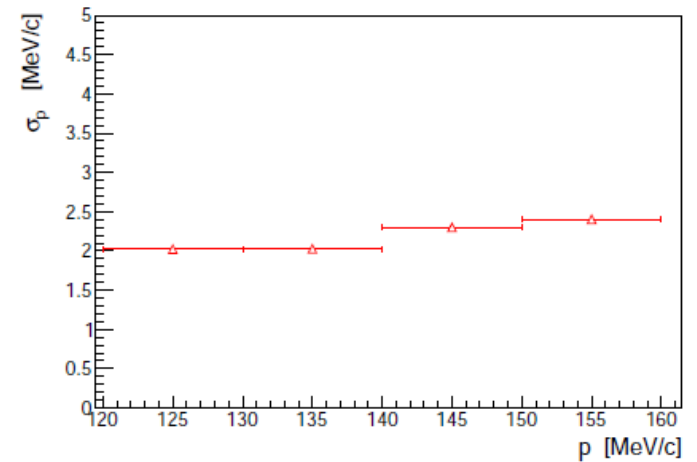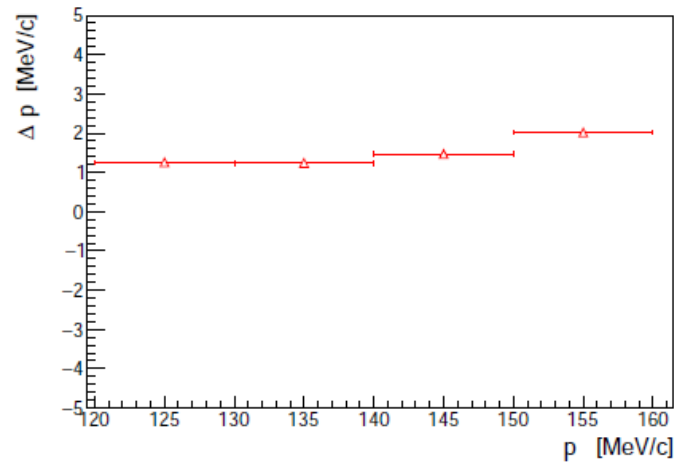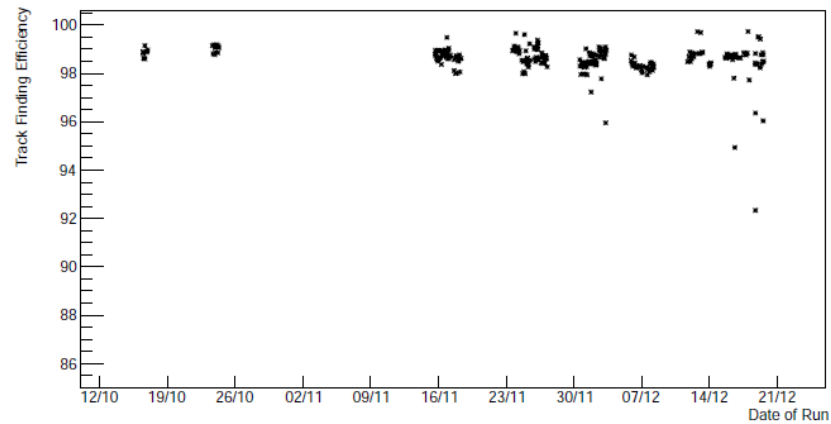- Momentum reconstruction bias and resolution (TKU)

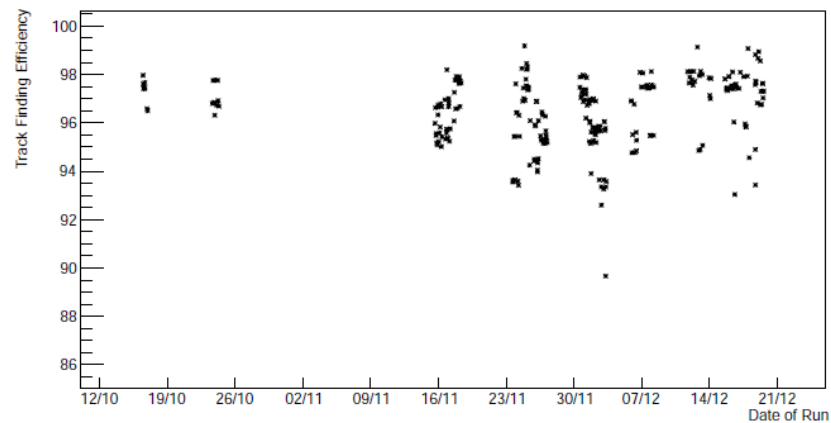# Trackers

- Momentum reconstruction bias and resolution (TKD)

Trackers

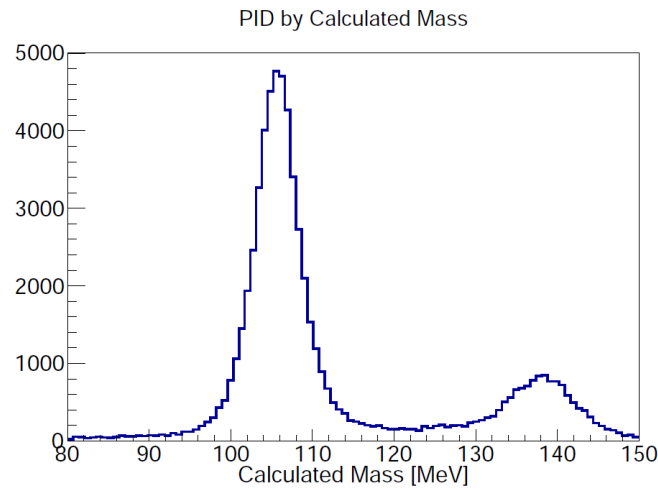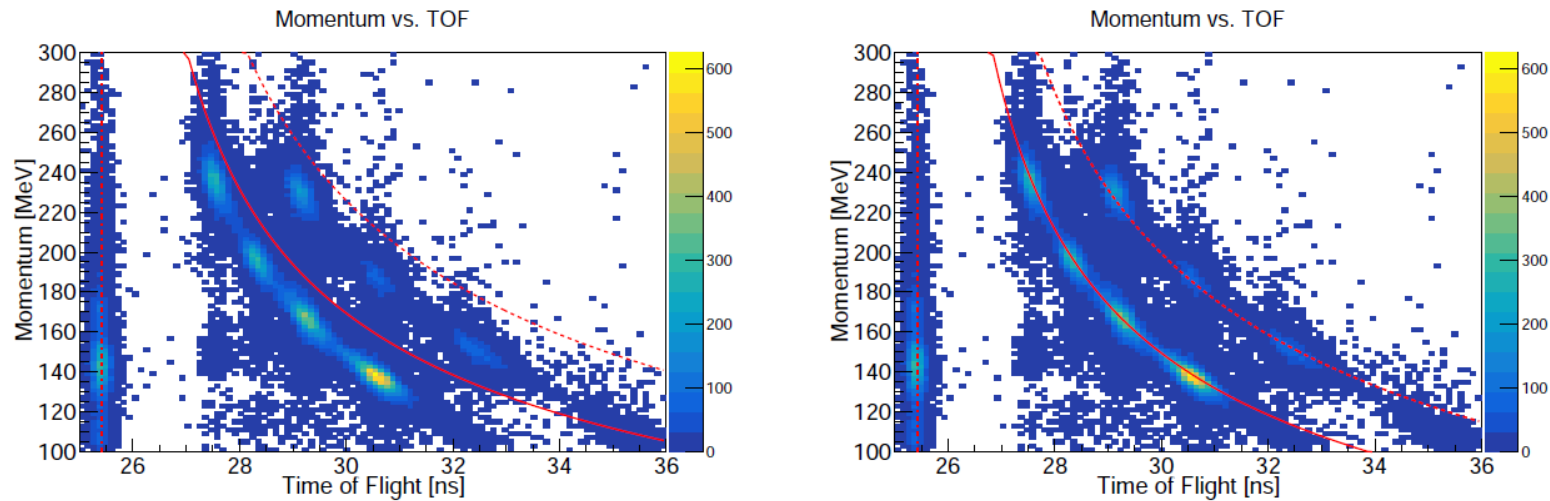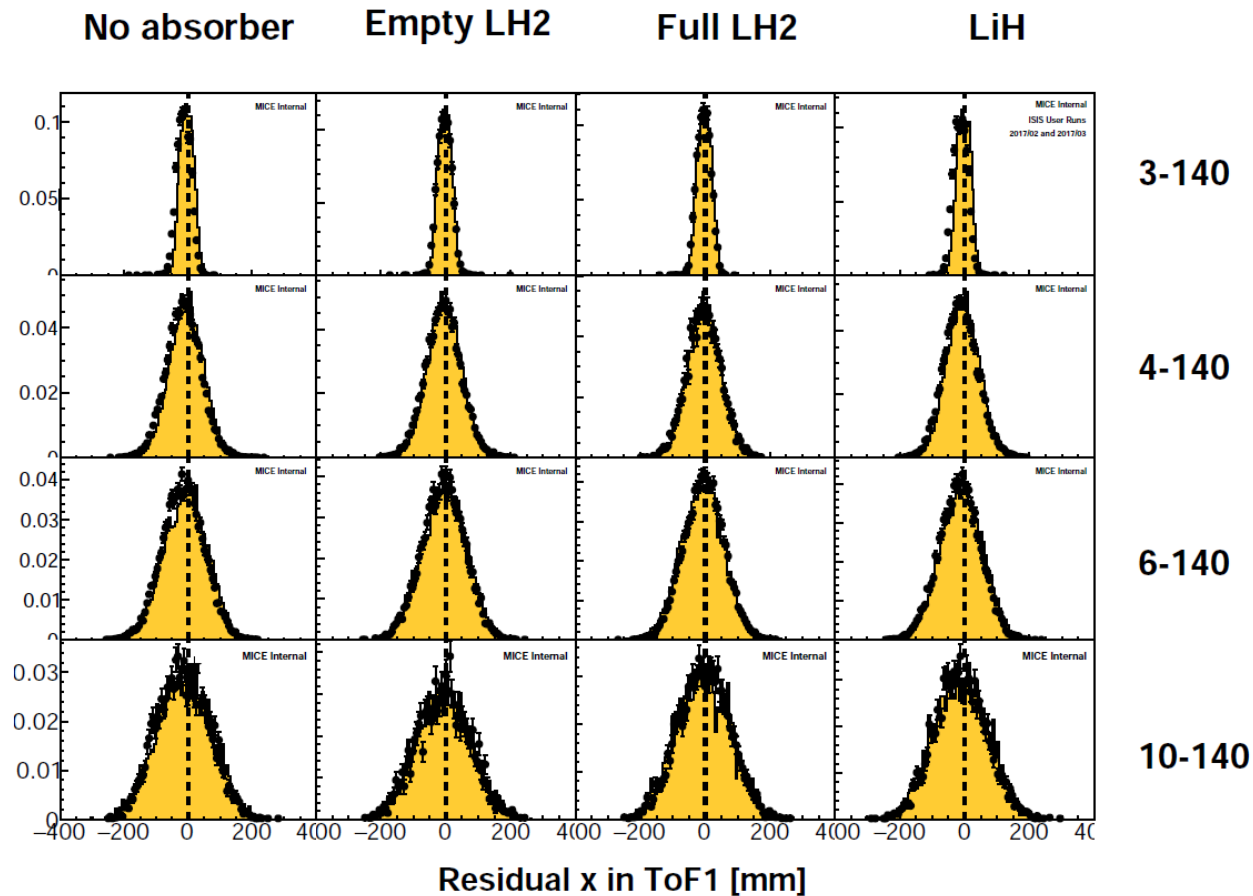- Track finding efficiency (late 2016)
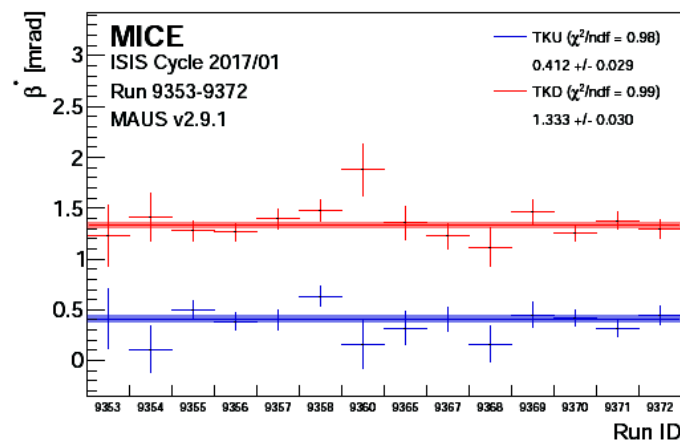
TKU

TKD
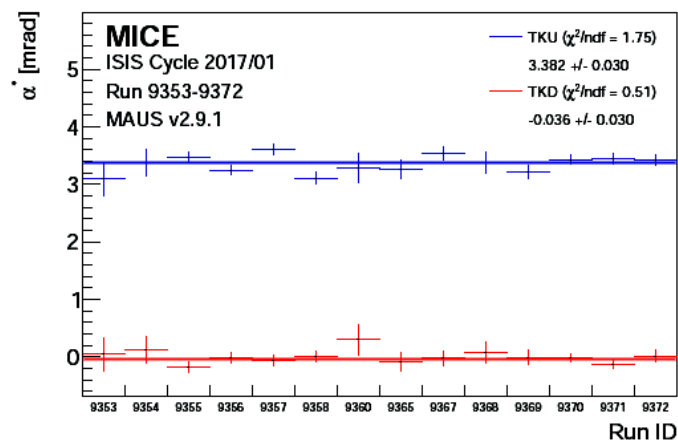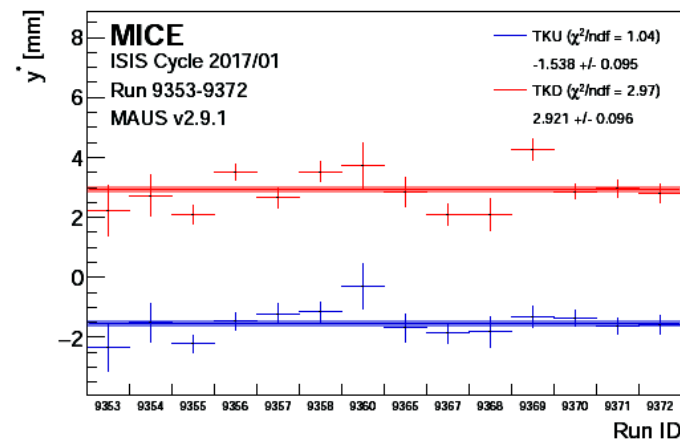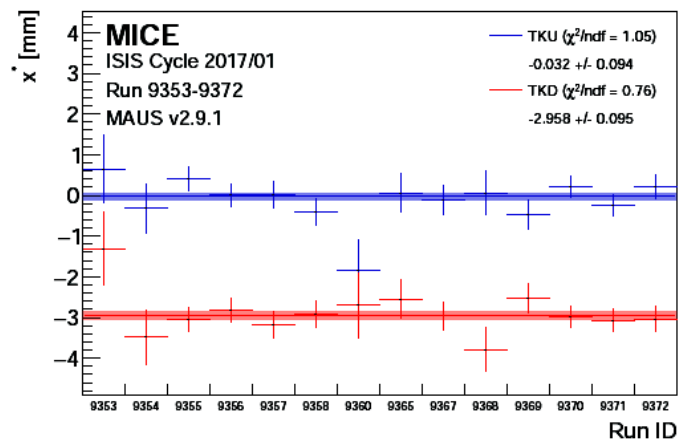
PID

- So far TOF and Tracker PID
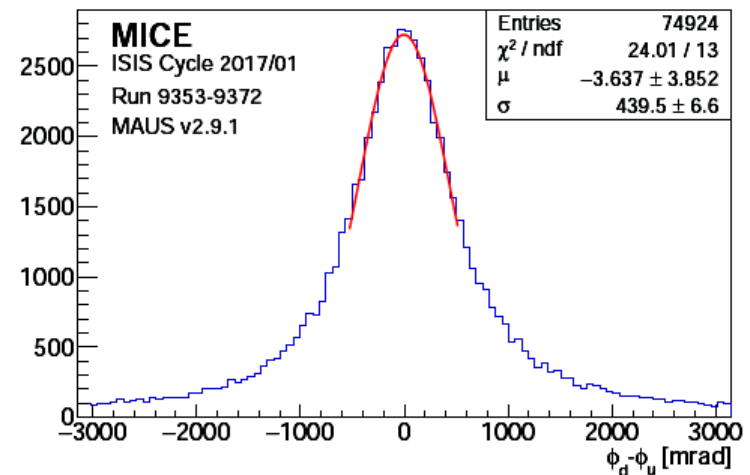
Track matching

- Residuals (to be updated)

Detectors alignment
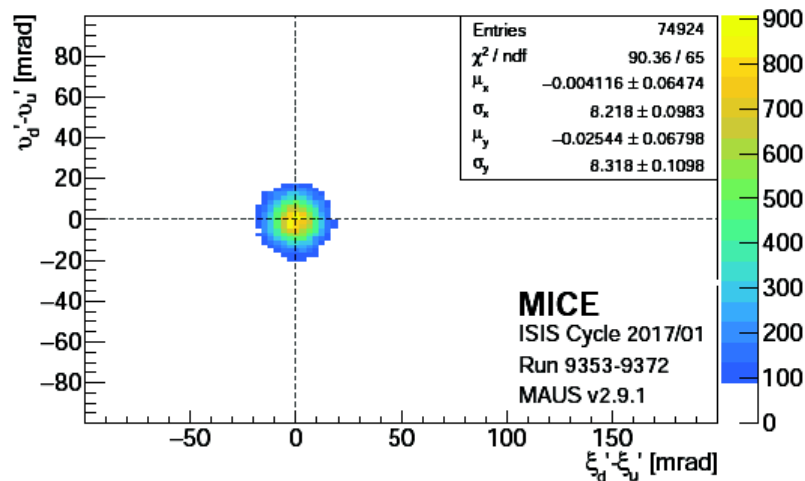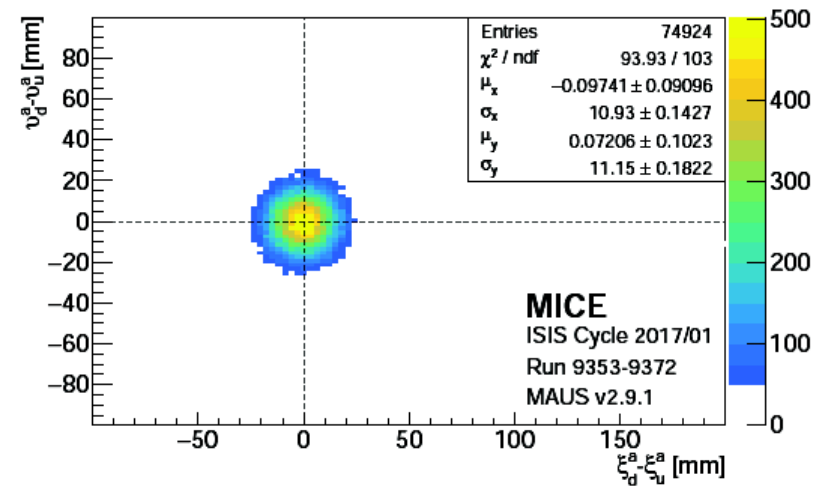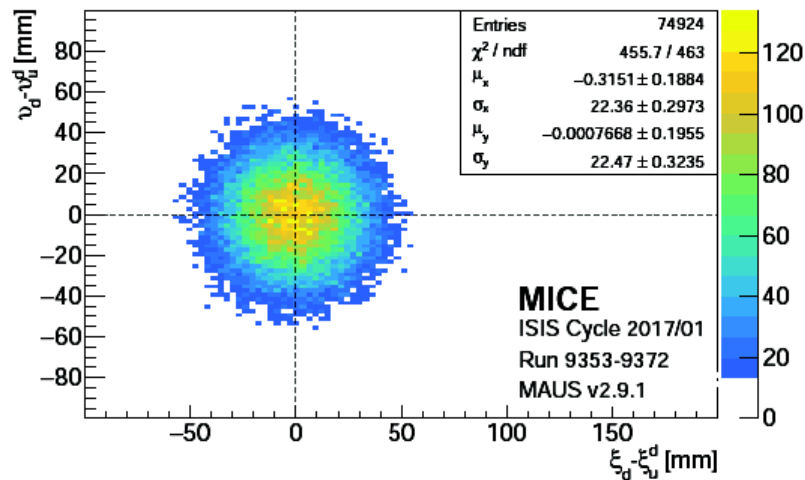
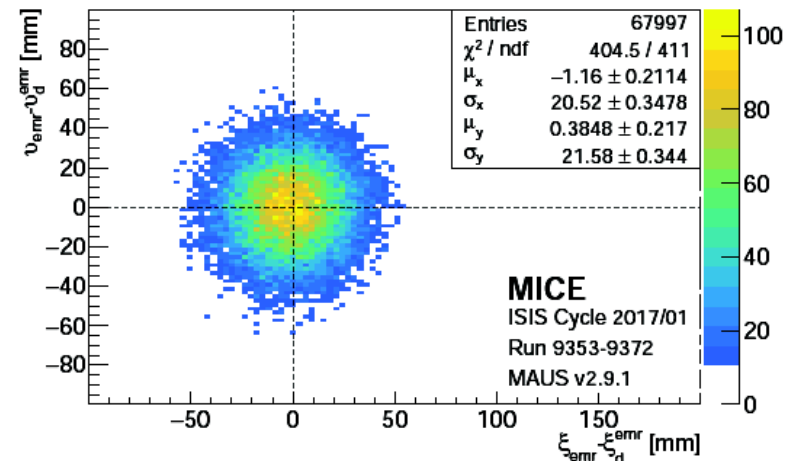- Alignment constants during 2017/01

Detectors alignment

- Residual distributions between trackers

Detectors alignment

- Tracker to TOF1/2, KL and EMR residuals
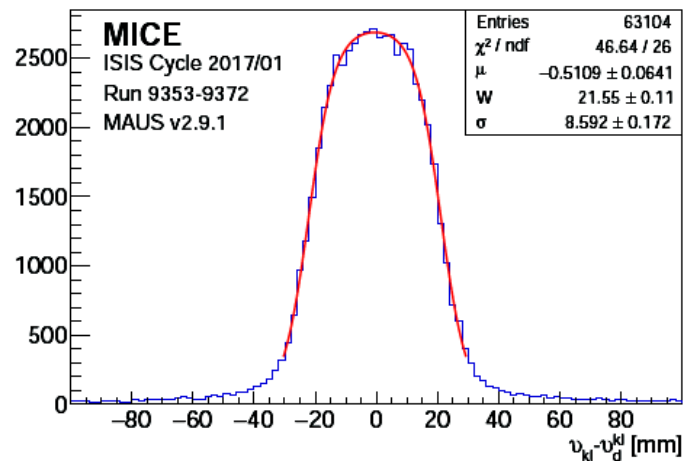
Liquid hydrogen

- Variation of the density

Vessel temp. sensors after corrections

- Contraction of the vessel due to cooling

- Deflection of the vessel due to pressure

- Variation of the windows thickness

To Do

- Review all the text and captions

- Plotting styles

- MAUS versions

- Datasets

- ~60 pages

Details

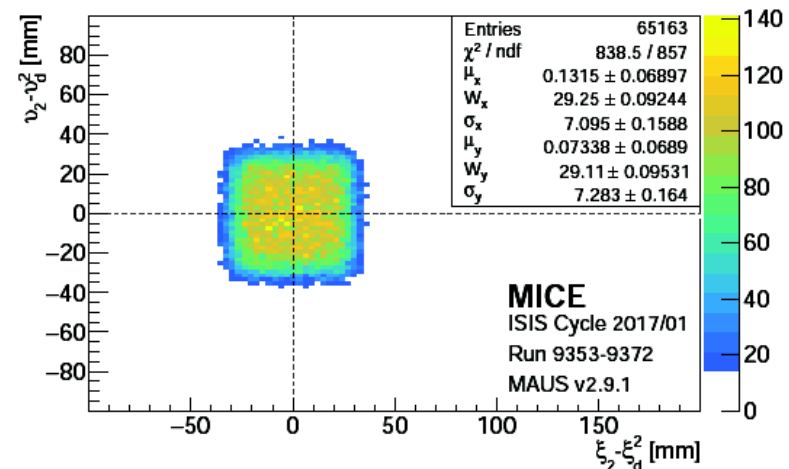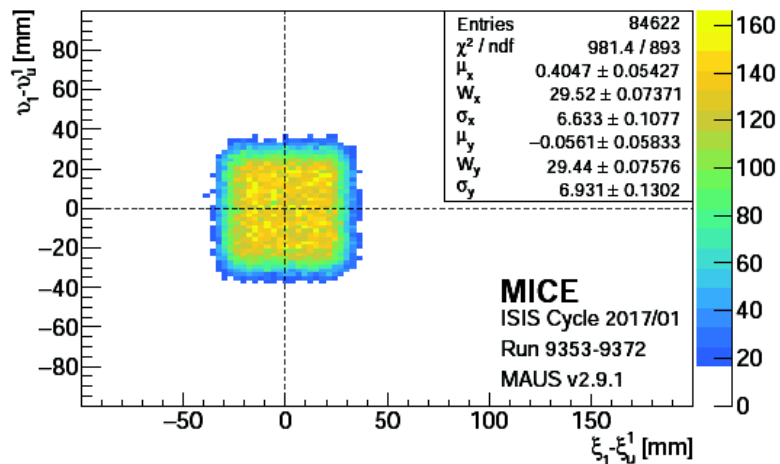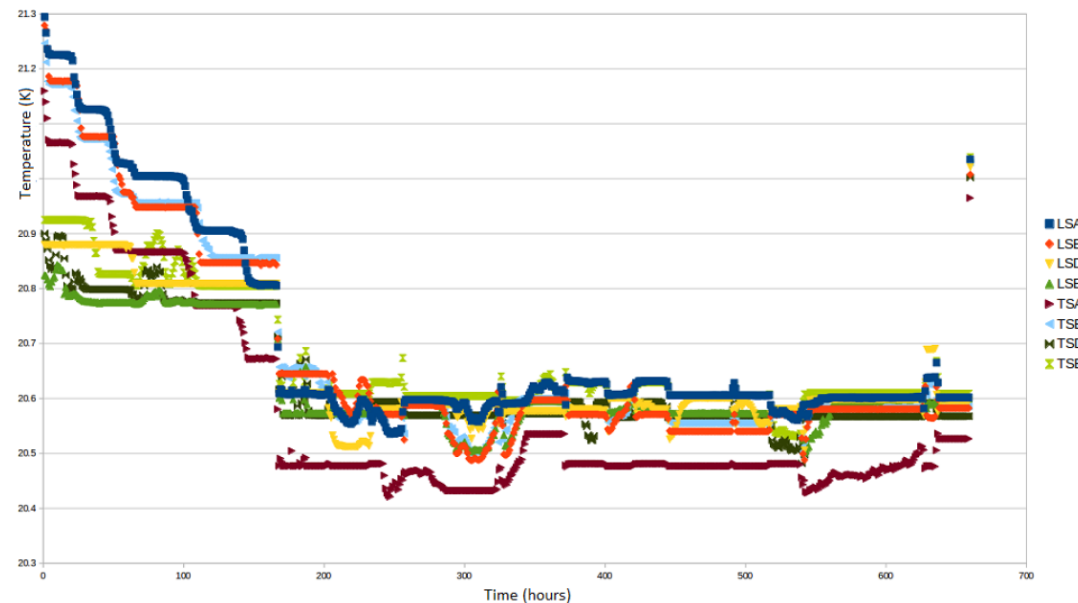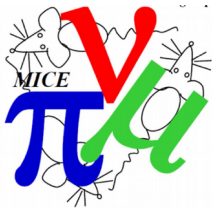- First reading by Chris (comments to implement)

- Referees: Alan B., Ludovico T.

- Repository: https://github.com/pfranchini/MICE-systems-performance-paper

- Few more details:
  https://micewww.pp.rl.ac.uk/projects/analysis/wiki/2018-09-18_system_paper