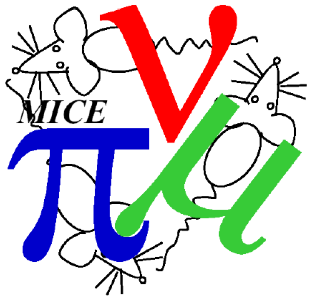

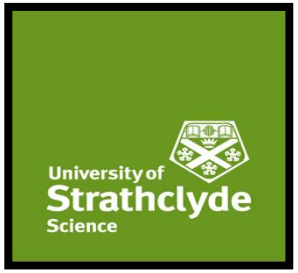

Field On Scattering

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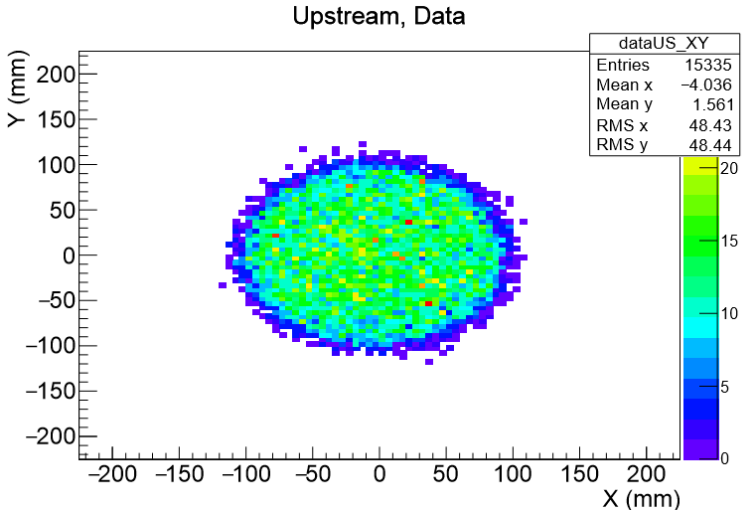
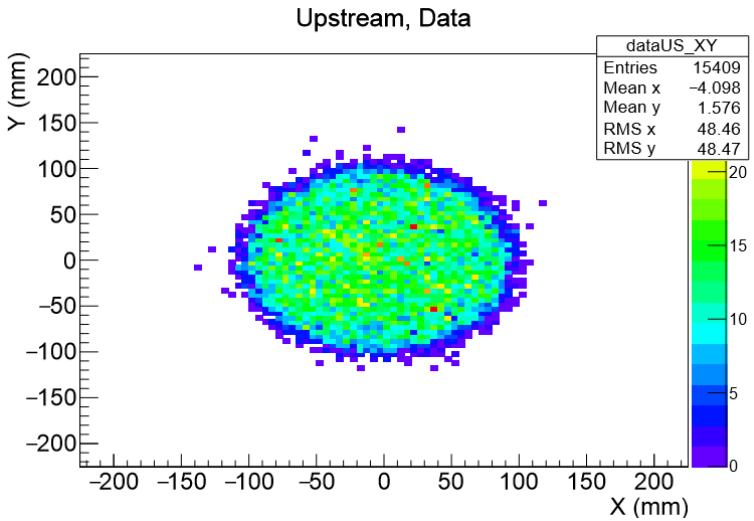
Illustration of change in XY distribution of Muons at Absorber when using projection and propagation





- Plots are for the same field off data set with the same cuts applied.
- Top plot uses projection to calculate XY coordinate of each muon for fiducial cut and at centre of absorber from upstream tracker
- Bottom plot uses propagation

Field on data runs for analysis

Data runs with LiH Absorber from Step 4 User Cycle 2016/03

140MeV/c	170MeV/c	200MeV/c	240MeV/c
8445 8446 8447 8452 8457 8465 8466 8470 8471	8448 8449 8453 8458 8464 8469	8450 8454 8455 8459 8463 8468	8451 8456 8460 8461 8462 8467

Data runs with no Absorber from Step 4 User Cycle 2016/03

140MeV/c	170MeV/c	200MeV/c	240MeV/c
8363 8372 8378	8364 8365 8373 8376	8366 8368 8369 8374 8375	8367 8370 8377

Data Selection

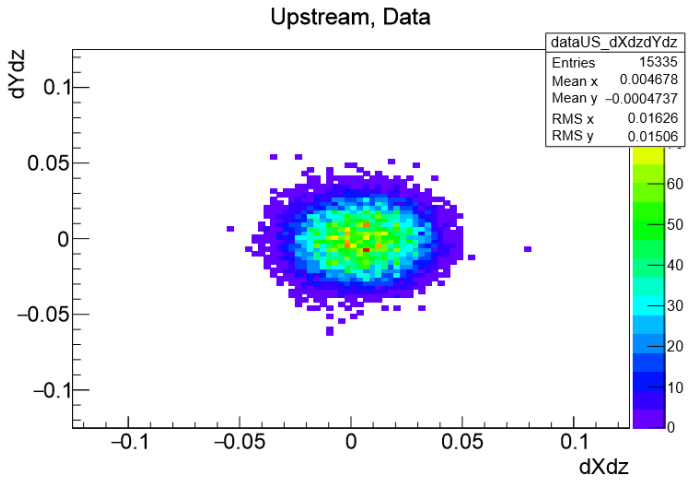
Currently 3 selection criteria

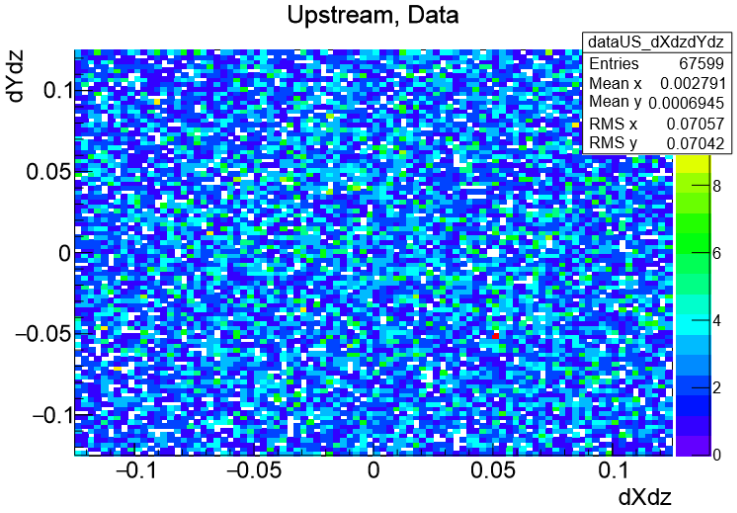
- Upstream Cut - Require an reconstructed track in the upstream tracker.
- TOF timing Cut – Currently .2ns window, to allow momentum binning
- Fiducial Cut - Require the track from the upstream tracker, when projected downstream to be within a specific radius at a point downstream in each station of the downstream tracker.

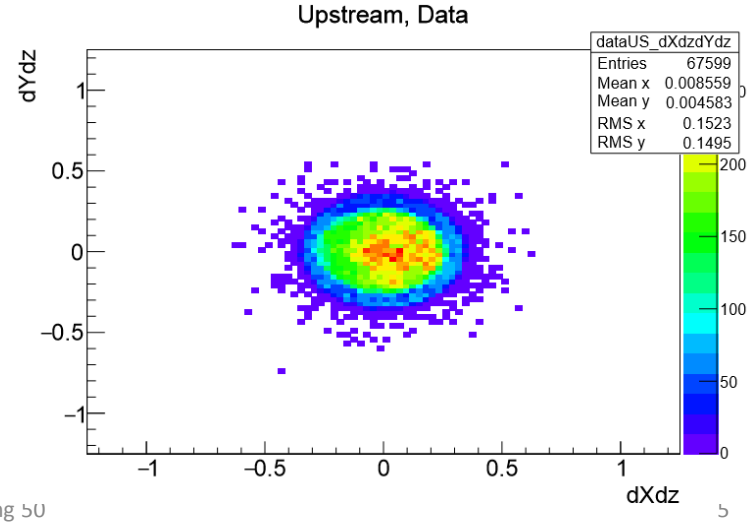
Proposed changes to data selection

- Increase TOF cut so that Muon peak selected
- Momentum binning using reconstructed track from upstream tracker
- Diffuser cut to remove any particles that pass through diffuser annulus

dx/dz vs dy/dz distribution of muons at absorber







Field off scattering analysis uses a 200ps width TOF01 cut to segment momentum.

With Field on expect a greater momentum spread as muons with a greater transverse momentum between TOF 0 and 1 will be transmitted.

Next Steps

- Use Globals to improve performance of code
- Carry out further validation checks on code
- Revisit cuts to improve quality of data being analysed
- Monte Carlo simulations of Field on with no absorber and configuration
- Account for scattering in material other than absorber.