Field Off Scattering Studies: Current Status

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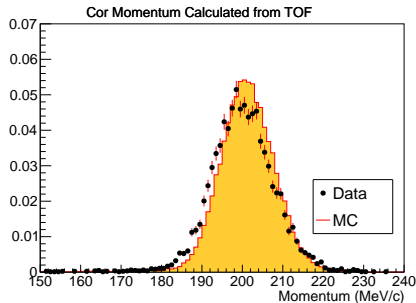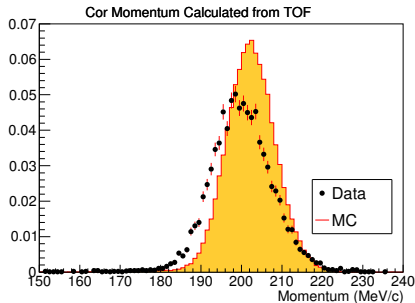
13/3/2020

Comments from the referees

- Momentum disagreement between data and MC
- Misalignment/asymmetry in scattering plot

P discrepancy Data/MC

- Suggestion was that rerun G4bl and MAUS sim & scale current in D2 as per Roger's analysis to resolve discrepancy
- Reran G4bl, reran MAUS, reduced data and reran analysis
- Local production $\sim 1000\mu$ vs. full production $\sim 60000\mu$

P discrepancy Data/MC

- Significant improvement for small MC sample produced locally at Glasgow
- Why is it so much better without any D2 scaling?
- Had an email exchange with Paolo who was able to provide some details
  - New geometry used in latest productions

```
===== ID: 272
CREATED ON: 2019-05-15 13:41:28.141000
VALID FROM: 2016-03-11 12:00:00
Added diffuser material.  Changed tracker glue composition
according to CR. Fixed tracker glue.  Fixed diffuser
support.  Fixed diffuser tungsten.  Updated geometry for
March 2016 LiH runs.  Fixed LiH density.  Fixed diffuser
positions and material.  Removed lh2 structure from
absorber volume.  Added virtual planes.
```

- Requested completely new MC production from Dimitrije

Issues overcome

- Install MAUS v3.3.2 - install script sets system libraries added before MAUS libraries - caused conflict

- TOF-tracker refitter set all trackpoints *xyz* co-ords to NAN for straight tracks - turned off refitter

- TOF_makeSpacePointCut (and TOF_findTriggerPixelCut) changed back to 0.5 ns from 3 ns - changed for π beam after Victor's study
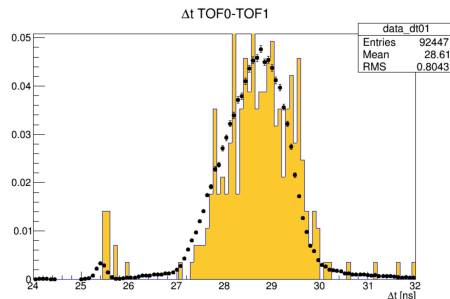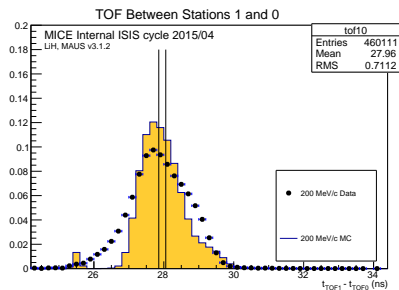
θ_Y discrepancy

- I have shown at previous meetings that the most expediant way to resolve this issue is by rotating the upstream tracks
- Scripts have been written to scan in rotation angle and check mean, asymmetry, skewness etc.
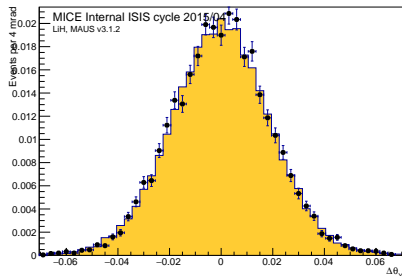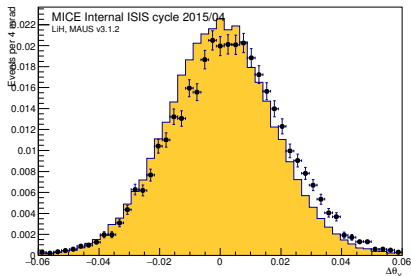
Job List

- All new plots and tables have been generated
- Circulate updated version of Note