Imperial College London

Science & Technology Facilities Council

Closing remarks

K. Long, 13 March, 2020

Papers

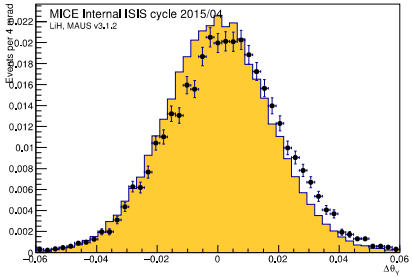
		01-Feb-20	v21		
Title	**Contact**	**Target date**		**Comments**	**Target**
		Preliminary	**Final**	**Jan-20**	**journal**
Measurement of multiple Coulomb scattering of muons in lithium hydride	J. Nugent	Jun18; CM51	Apr19	Progress	Euro Phys C? PRAB?
Performance of the MICE diagnostic systems	P. Franchini	Feb19; CM53		KL part of the problem. Commit to new draft for analysis meeting.	
Phase-space density/emittance evolution review paper					
Flip mode	P. Jurg	TBD		Full analysis chain in place.	
Solenoid mode	T. Lord	TBD			
Phase-space density/KDE/6D-emittance evolution	C. Brown	TBD		Thesis published on initial analysis; taken over by C.Brown	
Measurement of multiple Coulomb scattering of muons in LH2	J. Nugent	TBD		Awaits completion of LiH paper	
Field-on measurement of multiple Coulomb scattering	A. Young	TBD		Analysis underway	
LH Scattering	Gavril	TBD		Analysis underway	

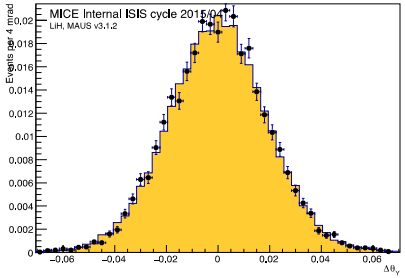
LiH, field off scattering; JN

- Issues in reconsruction seem to have been recovered
- Moving on to next iteration of MICE Note

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.





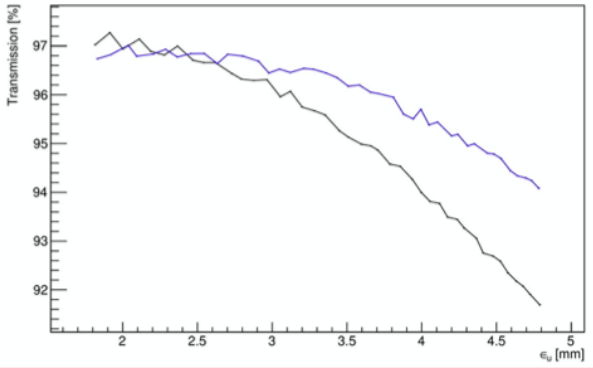
System performance; PF

- Was stalled on my desk; now unlocked
- Need to keep up momentum:
  - Spotlight is on PF & KL

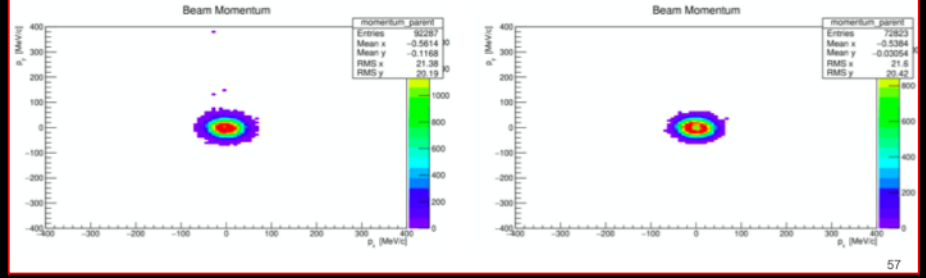
Flip-mode emittance evolution; PJ

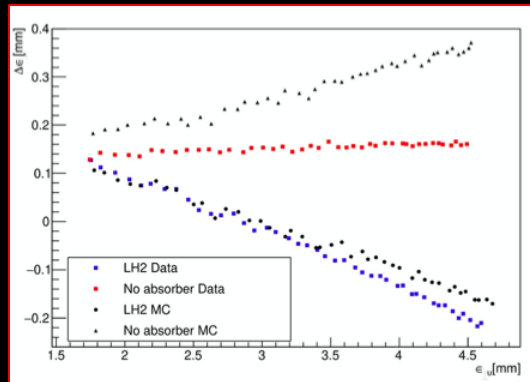
- **Good progress:**
  - **Beam selection, evaluation of ensemble quantities, & data/MC comparison all advancing**
- **Issues:**
  - **Δε vs ε for no absorber**
  - **Low PT hole in hybrid MC**

- Blue - LH2
- Black - No absorber
- Calculated equilibrium emittance (for $\beta \sim 540$ mm) is ~ 2.4 mm
- Cooled beams present better transmission above the equilibrium emittance



- after applying the [135,145] MeV/c upstream momentum cut to the hybrid MC beams, the low-P_T shows up (RHS plot)





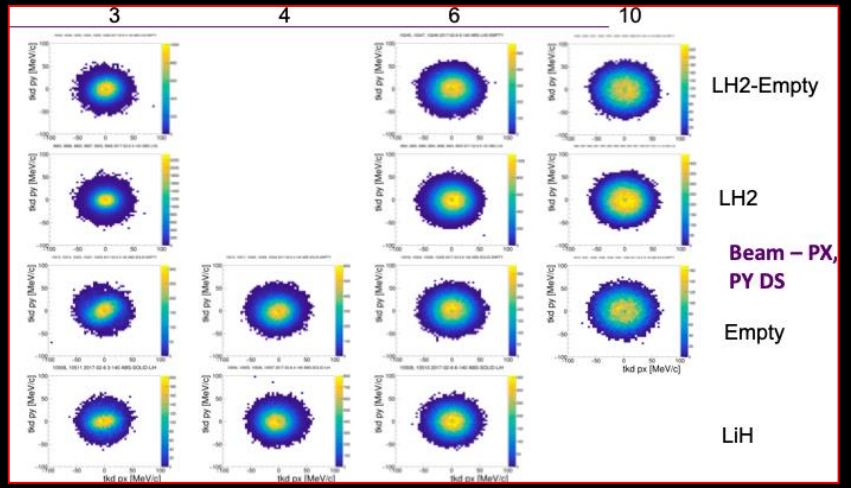
No absorber - in data, heating slightly dependent on emittance. Correlation stronger in MC. Possible cause could be the difference in optics at the upstream -> enhanced exposure to non-linear effects.

LH2 - discrepancy between data and MC occurs for beams with emittance above 3.5 mm. Needs digging.

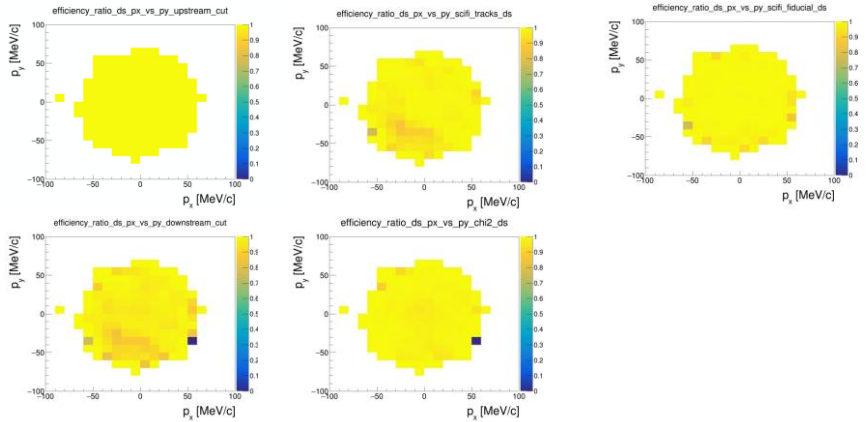
Hybrid MC (truth) studies required.

Emittance evolution, solenoid mode; TL

- Good progress:
  - Selection, analysis, some systematics
- Issues:
  - Efficiency; related to low pt hole?
  - Mis-reconstruction; MC recon vs truth
  - Beam distributions
  - 3-170 amplitude distributions poor

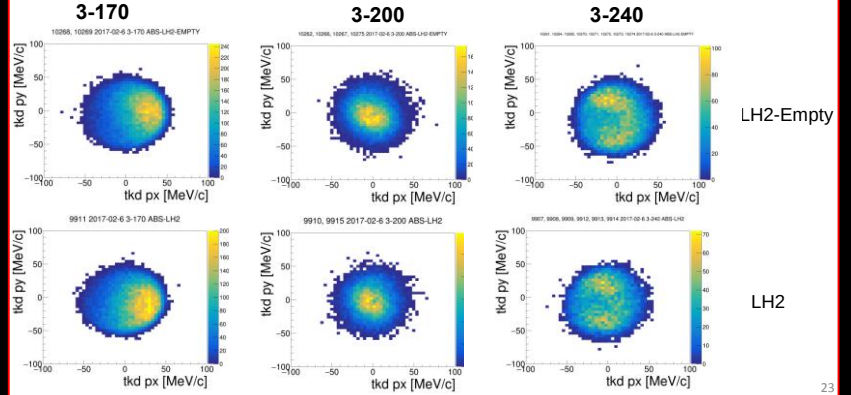


DS



Higher momentum runs, solenoid mode

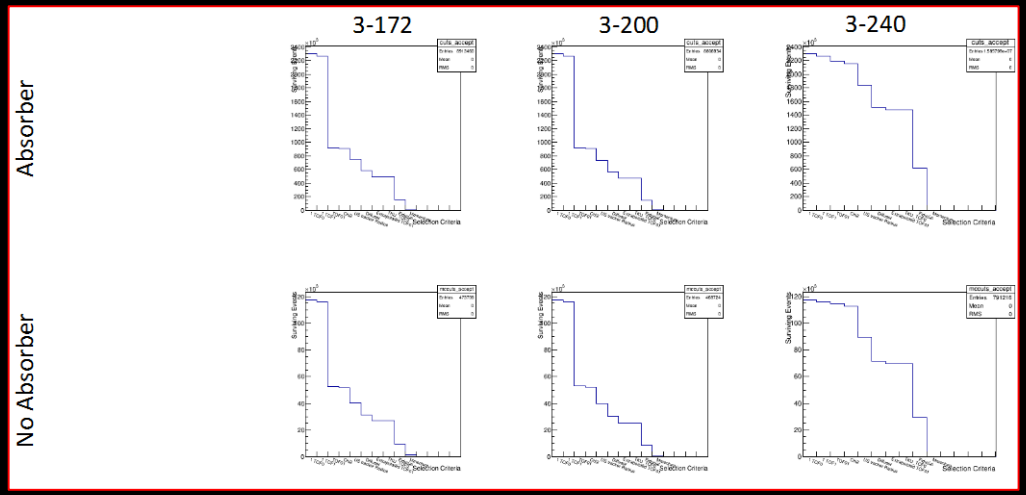
Strong bias in pxpy plots for higher mom beamline. Suggestion is this could be from refitting of momentum based on TOF01 + TRACKER combined refit – Testing without TrackerTOFCombinedFit to see if this changes



Field-on scattering: AY

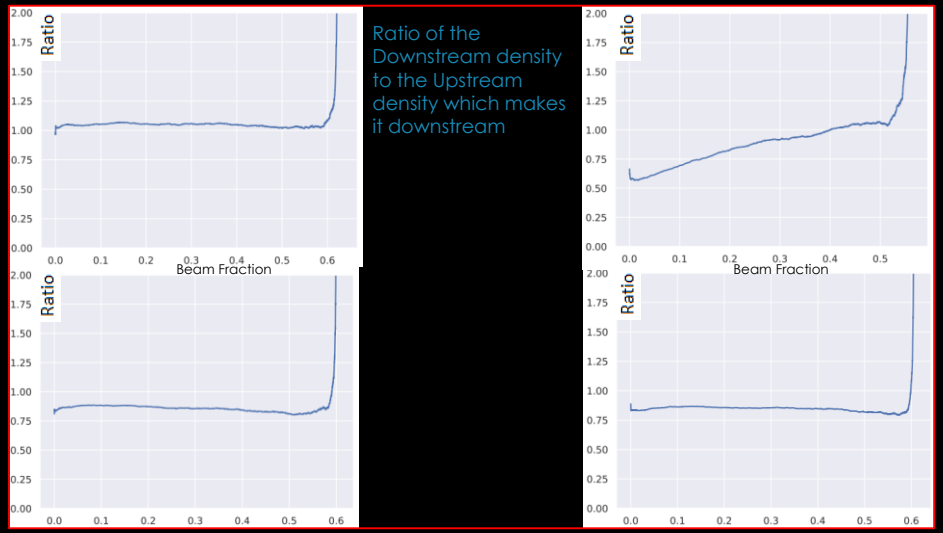
- Good progress on event selection and cut studies

- Issue:
  - Size of event samples, particularly for 2-240, no absorber



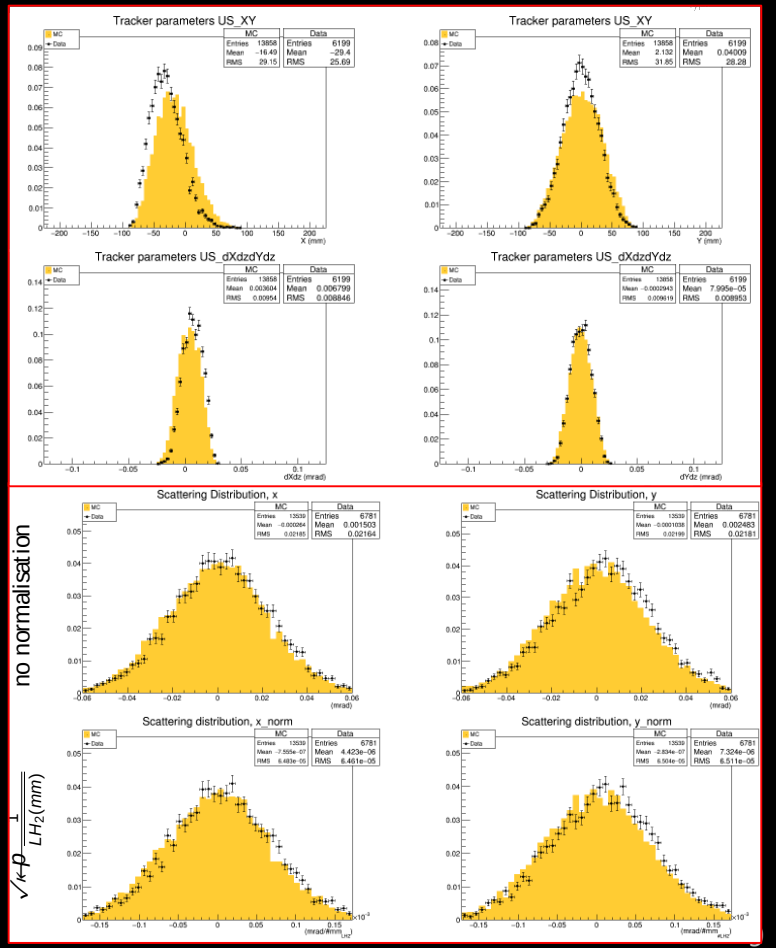
Emittance exchange: CB

- Principal issue is low efficiency for accepting event downstream
  - Low PT hole a contribution
  - Common with TL analysis
- Clearly need to address this



LH_2 scattering: GC

- Good progress:
  - Event selection, data/MC comparison
  - Scattering distributions and some systematic studies
- Issues:
  - Evidence that some beam returning needs to take place for *x* distribution



Future meetings

- 2020:
  - CM57:
    - 22/23 October 2020
  - CM58:
    - March 2021
  - CM59:
    - October 2021

- Analysis workshops:
  - Subsequent meetings to be announced by C. Rogers

- Video conferences:
  - 09Apr20
  - 04Jun20
  - 03Sep20

Thanks to:

- You all for coming, presenting and arguing!
- The local team:
  - Trudi
- *Chris Rogers:*
  - Physics Coordinator & ampl. evolv. paper lead
- See you at CM56 at RAL in Mar20
- … my best wishes for a safe journey home …