Introduction

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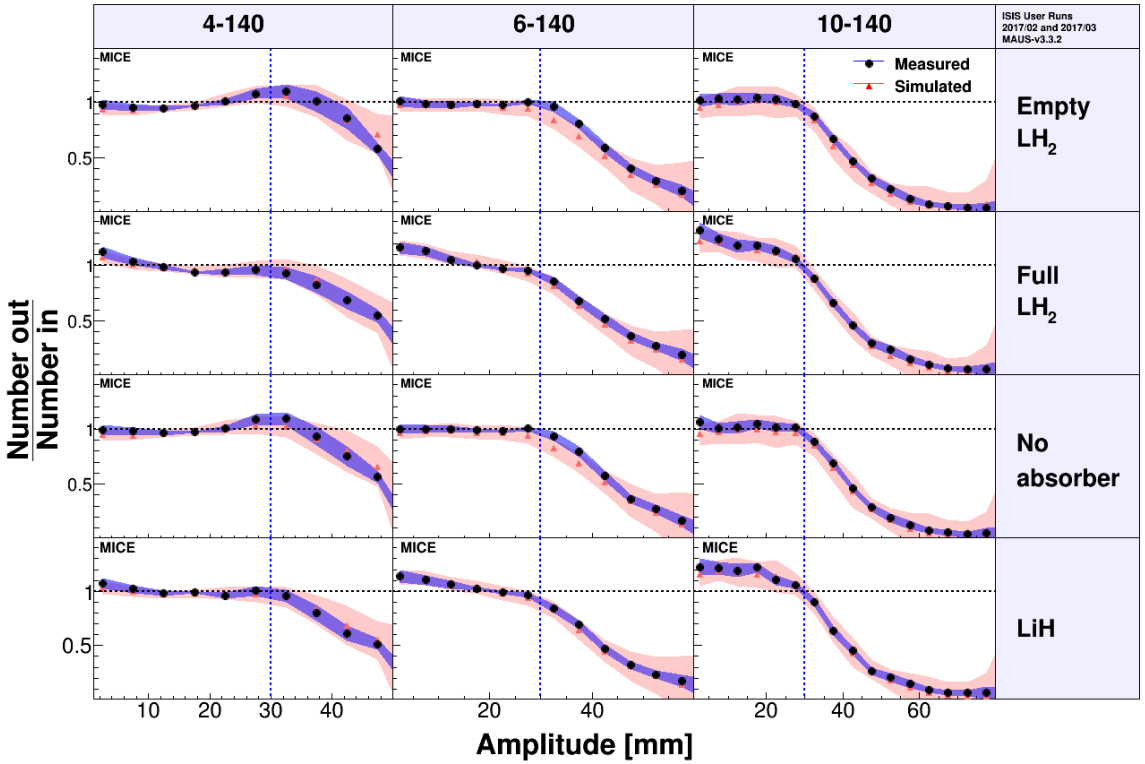
Reminder – Publication plan

		12-Jun-19	v16		
Title	**Contact**	**Target date**		**Comments**	**Target**
		Preliminary	**Final**	**Jan-19**	**journal**
Phase-space density/emittance evolution; rapid communication	C. Rogers	Apr18 w/s	Apr19	4th referees meeting before around CM53 (21, 22Feb19, RAL)	Nature
Measurement of multiple Coulomb scattering of muons in lithium hydride	J. Nugent	Jun18; CM51	Apr19	Unfolding issues; perhaps resolved; CM53, 21,22Feb19, RAL	Euro Phys C? PRAB?
Performance of the MICE diagnostic systems	P. Franchini	Feb19; CM53		Almost complete draft	
Phase-space density/emittance evolution review paper	C. Hunt	TBD		Full analysis chain in place.	
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	

- Where do the priorities lie?
- Where should we focus our remaining resource
  - Discuss this afternoon

Emittance Evolution

First observation paper



- Paper now at final reading – please read and comment!
  - http://micewww.pp.rl.ac.uk/projects/analysis/wiki/First_demonstration_of_ionization_cooling_using_the_Muon_Ionization_Cooling_Experiment_Draft_2
  - Note the plot shown here is now updated with full MC statistics
- Discuss
  - Next steps
  - Delivering the remaining analyses

Detailed emittance evolution

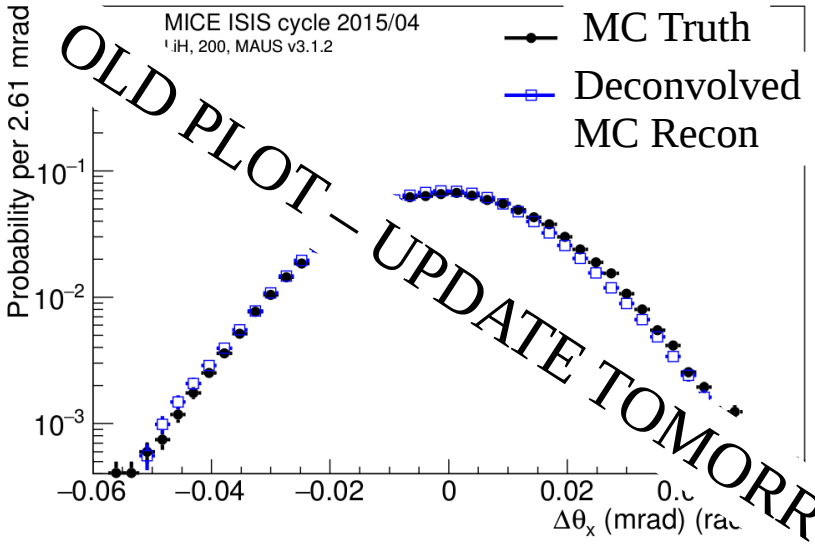
- Handover from Chris Hunt → Paolo and Paul Jurj
- Scope of the paper is huge
- Some new aspects to the analysis may arise
- Current plan is to split by flip vs non-flip
  - Flip → similar analysis to the “first observation” paper
  - Non-flip
    - study angular momentum
    - may choose eigenmode analysis
- Jobs
  - Systematic errors @ 2 T, 3 T and 140 – 240 MeV/c
  - Detector inefficiency/resolution corrections @ 2 T, 3 T and 140 – 240 MeV/c
  - PID esp at 200, 240 MeV/c
  - MC generation and analysis
  - Beam subsampling
  - Improved understanding of momentum scale
    - Reconstruction in full field maps
  - **Dealing with problems**

Wedge analysis

- Getting to grips with the analysis
  - Beam weighting/sampling
  - Phase space density or equivalent analysis
- Can we crystallise this into a full analysis loop
  - Sample selection
  - Detector resolution and efficiency
  - Systematic and Statistical uncertainties
  - Result
- Note this is only the second time 6D emittance, including correlations, has been reconstructed
  - We may have higher resolution, TBD

Scattering Analysis

Field-off scattering (Nugent/Gavril)



- Still rumblings of misalignment issues
  - Possible bias in Kalman reconstruction in data but not MC
  - Slides later this afternoon

Field-on scattering

- Should allow larger angles to be measured
- Can we move to a convolution or deconvolution analysis?
  - Sample selection
  - Detector resolution and efficiency
  - Systematic and Statistical uncertainties
  - Results

System Performance Paper

System performance paper

- Progress in cutting down on the number of plots
- Need to plug away at the sub-analyses
  - Make sure that everything presented is self-consistent and shows the experiment in its best light

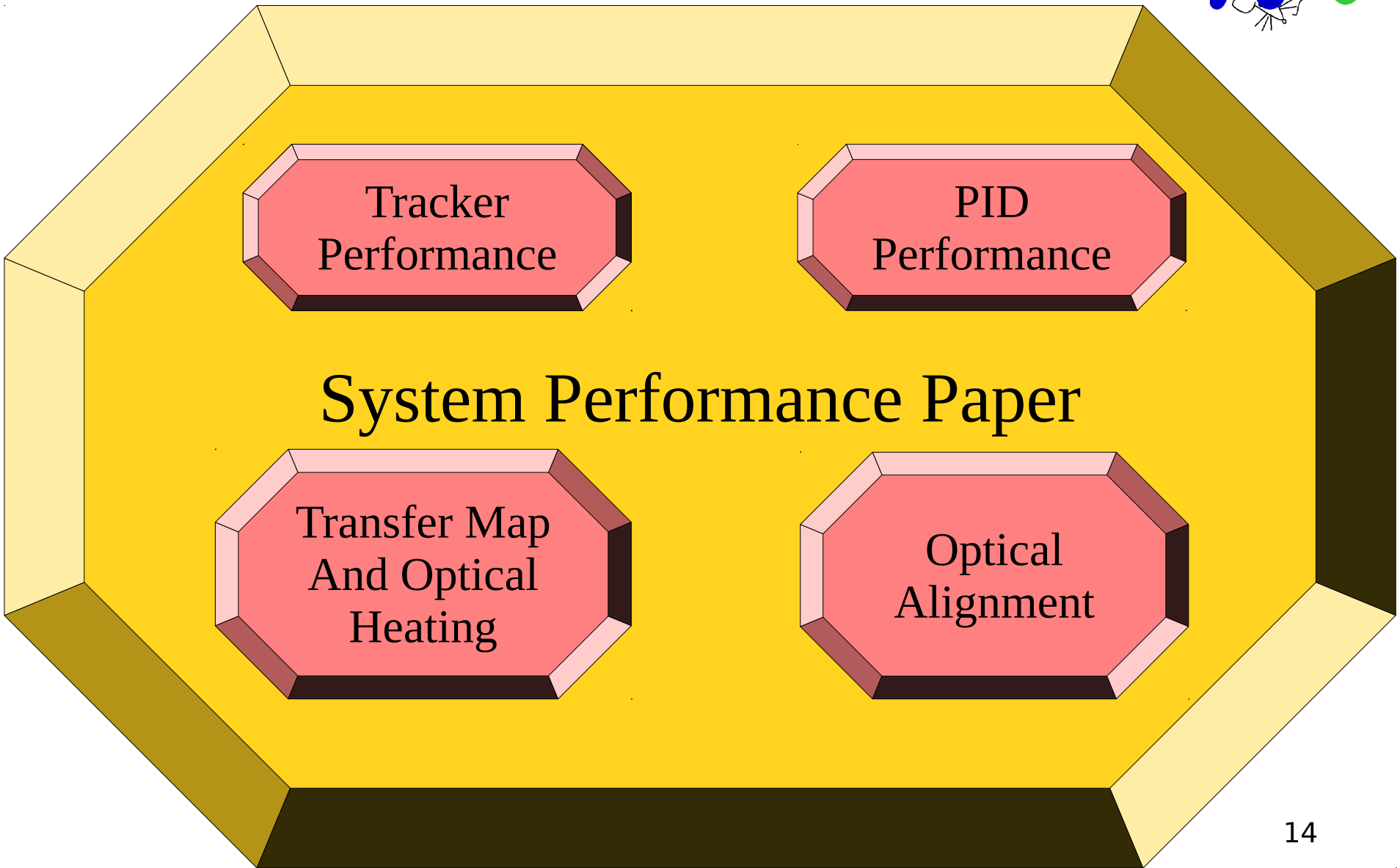
Energy loss analysis

- Most complicated “system performance” analysis
  - Looking for agreement between data and MC
  - Looking at effects like hydrogen absorber thickness?
- May come in too late for system performance paper
  - Potentially can go in with emittance analysis
  - Probably not enough for standalone paper

Optical alignment and aberrations

- Understanding the alignment of the optical system is important
  - Demonstrate understanding of the system
  - Untangle issues e.g. momentum inconsistencies
  - Prerequisite to understanding the aberrations
- Alignment algorithm c/o Chris Hunt
  - Other concepts by Chris Rogers, YingPeng
- Understanding of the aberrations valuable theory
  - First particle-by-particle measurement of transfer map/higher order terms?
  - Beamlet analyses do exist…
- Where does this sit in the priority list

Other Papers and Techniques



Other Papers - Measurements