

Spokesman's update

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PAPERS

Papers in progress

Title	Contact	Comment
Step IV physics		
First measurement of emittance in Step IV	V. Blackmore	Preliminary results made public. Results being finalised so publication can be prepared.
Measurement of scattering distributions in MICE	R. Bayes	Preliminary results made public. Work continues following meeting with referees.
Ionization cooling demonstration		
Design and expected performance of the MICE demonstration of ionization cooling	J.B. Lagrange	Revised version to be circulated tomorrow (13Jan17).

Title	Contact	Comment
Technical		
The Reconstruction Software for the MICE Scintillating Fibre Trackers	A. Dobbs	http://dx.doi.org/10.1088/1748-0221/11/12/T12001
The MICE Analysis and User Software framework	D. Rajaram	In preparation

Publication strategy

- **Physics:**
 - **Demo paper:**
 - **Draft will be re-circulated to collaboration: 13Jan17**
 - **Comment deadline: 19Jan17**
 - » **High threshold for additional changes:**
 - Paper has been circulated to collaboration twice
 - Comments from previous rounds have been taken into account or dealt with to the satisfaction of the commenters
 - Internal referees have “signed off”
 - **Submission as RAL note, arXiv and journal: 20Jan17**
 - **So spotlight moving to:**
 - **Emittance measurement ... field-off scattering**
 - **CM47: define next wave of public results and publications**
- **Technical:**
 - **Tracker s/w paper now in the journal ... so ...**
 - **Spotlight on MAUS paper ...**

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PREPARATION FOR THE NEXT ISIS CYCLE

ISIS Cycles and science programme

ISIS Cycle	Date From	Date To	# Days	###	1 Jul 16	1 Aug 16	1 Sep 16	1 Oct 16	1 Nov 16	1 Dec 16	1 Jan 17	1 Feb 17	1 Mar 17	1 Apr 17	1 May 17	1 Jun 17	1 Jul 17	1 Aug 17
2015/04	16 Feb 16	25 Mar 16	46															
2016/01	12 Apr 16	20 May 16	38															
2016/02	28 Jun 16	29 Jul 16	31															
2016/03	13 Sep 16	28 Oct 16	45															
2016/04	15 Nov 16	16 Dec 16	31															
2016/05	14 Feb 17	31 Mar 17	45															
2017/01	2 May 17	2 Jun 17	31															
2017/02	11 Jul 17	4 Aug 17	24															

Step IV:

Material properties of LH_2 and LiH that determine the ionization-cooling performance

Observation of ϵ_{\perp}^n reduction

MICE demonstration of ionization cooling:

Observation of ϵ_{\perp} reduction with re-acceleration

Observation of ϵ_{\perp} reduction and ϵ_{\parallel} evolution

Observation of ϵ_{\perp} reduction and ϵ_{\parallel} and angular momentum evolution[†]

[†] Requires systematic study of “flip” optics.

• LiH :

- Scattering programme done
- Emittance-evolution programme going well

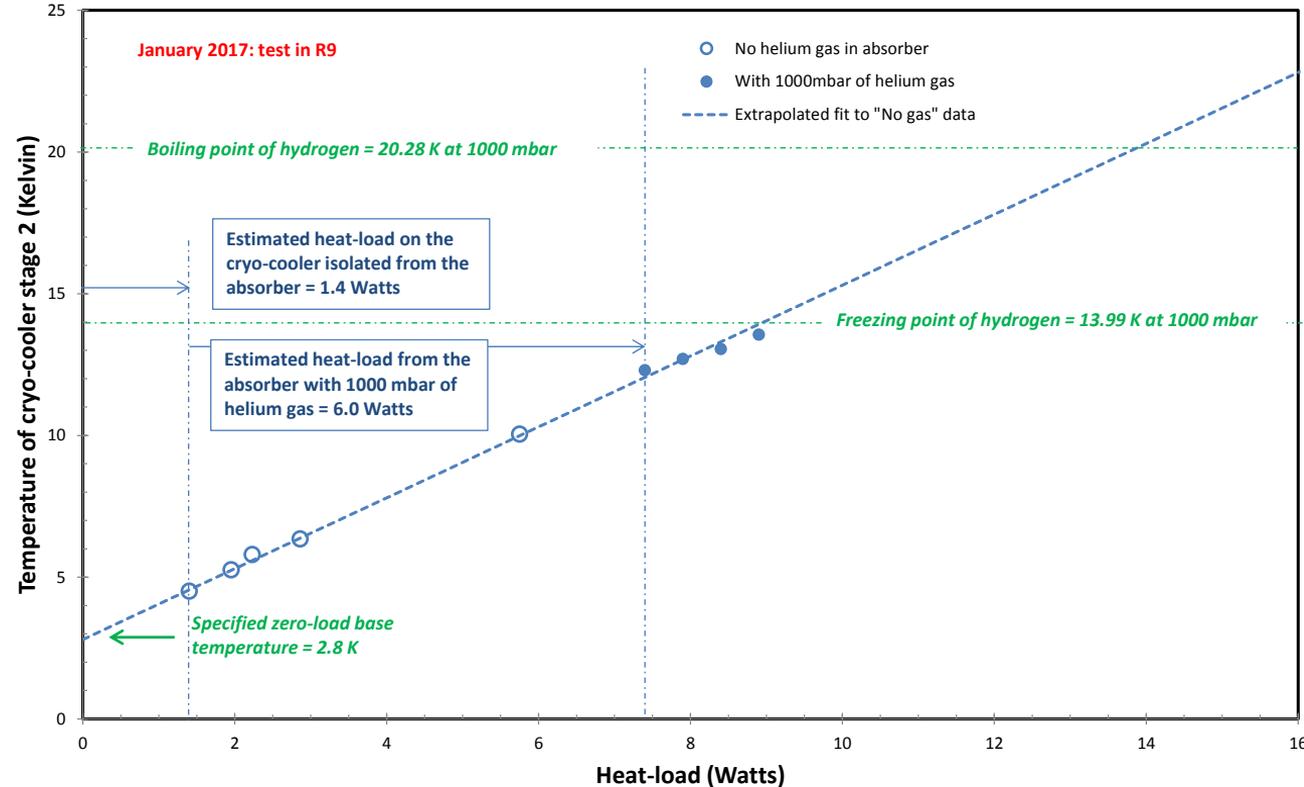
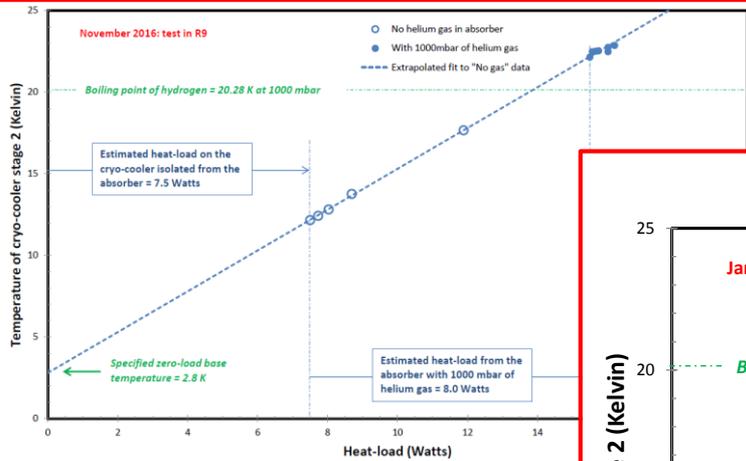
• LH_2 :

- Seek to install for data taking in May17 – the last Cycle for which we are presently approved

- Dates: start 14Feb17; end 31Mar17
- “Run plan”:
 - First three weeks:
 - Flip-mode, emittance evolution (cooling) data taking
 - Shift sign-up is live:
 - Please sign-up to get your favourite slots!
 - Second three weeks:
 - Depends on progress on LH₂ system

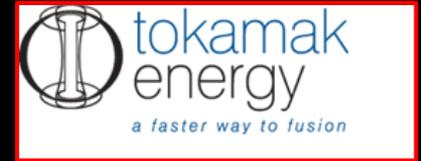
LH₂ system status

Heat-loads on the cryo-cooler of the hydrogen system in the AFC



- Excellent progress!
- Test cool-down in R9 using neon now being planned
- More details from V. Bayliss

- **Controls and Monitoring Coordinator:**
 - **P. Hanlet will leave for Tokamak Energy (Abingdon) in February**
 - **Congratulations to Pierrick! (and Tokamak Energy)**
 - **Pierrick has done so much for MICE ...**
 - **A. Kurup will take over as Controls Coordinator**
 - **PMH and AK have been in a “hand-over” for a couple of weeks**
 - **Formal handover date: 13Jan17 ... tomorrow!**
 - **Please address all controls and monitoring issues to AK from now on ...**
 - **... and of course, support him in taking up the reins**



Expert-led startup

- E. Overton has taken over Online from Y. Kharadzhov
AK has taken over Controls from PMH ... so ...
 - Taking a longer “run up” to the start of the coming Cycle
- Key dates:
 - Week of 23Jan17 will see full system restart
 - Seeking half a shift with beam during ISIS machine run up
 - Hoping this will be before CM47
 - Target presently: half a shift on 11Feb17

Commissioning of magnetic channel in flip mode

- Flip mode requires:
 - FC coils to be run in opposition
 - Polarity of SSD to be reversed
- Commissioning:
 - FC in flip mode started yesterday (11Jan17)
 - SSD in reversed polarity (check) goal this week
- Settings for Cycle 2016/05:
 - Goal: take data with three magnetic-channel settings
 - Analysis Group will prepare 3+2 channel settings
 - Provisional settings already circulating in Analysis Group
 - Deadline for provision of 3+2 settings: 31Jan17

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UPCOMING MEETINGS, PROPOSAL AND REVIEWS

MICE CM47

13-15 February 2017

RAL

Europe/London timezone



Overview

Timetable

Contribution List

Participant List

MICE ADMIN

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The 47th Muon Ionization Cooling Experiment (MICE) Collaboration Meeting will be held at the STFC Rutherford Appleton Laboratory, Harwell Oxford Campus, Oxfordshire from 13 to 15 February 2017 inclusive

Registration £45.00

Collaboration Dinner £35.00



Starts 13 Feb 2017 08:55
Ends 15 Feb 2017 17:00
Europe/London



RAL
CR 12 and 13 Building R68

Proposal to upgrade Step IV to deliver a demonstration of ionization cooling

December 30, 2016

Skeleton

The MICE collaboration

Proposal to upgrade Step IV to deliver the demonstration of ionization cooling

Executive summary

Lead author: KL

- Skeleton produced, lead authors defined
- Need to deliver good draft before CM47
- Indication of *recognition by STFC* of benefits of continuing and developing R&D in muon acceleration, including:
 - MICE, nuSTORM and 6D cooling
- STFC “*need*” is to see MICE as an essential part of a programme in which STFC can demonstrate to government that MICE has/will deliver an outstanding legacy and in which the UK has the potential of continued leadership and contribution going forward:
 - “Good, but no cigar”!
- Our job:
 - Deliver Step IV
 - Prepare an excellent programme with a first-rate vision

International review of project

- **Resource Loaded Schedule Review: 07Mar17**
- **MICE Project Board: 07—08Mar17**
- **Funding Agency Committee: 08Mar17**
- **Soon: requests for “copy” and presentations**

Dates for your diary

- **CERN Physics Beyond Colliders workshop:**
 - **nuSTORM at CERN: a work package in the workshop**
 - **A first meeting to discuss how to proceed:**
 - **16Feb17; 13:00—16:00 GMT at Imperial College London**
 - **Teleconferencing facilities will be provided**
- **IPPP/NUSTEC topical meeting on neutrino cross sections:**
 - **HEP and nuclear experimenters, phenomenologists and theorists ... and lattice QCD experts**
 - **Will take place in Durham 18—20 April 2017**
 - **Goals of the meeting will include initiation of discussion of:**
 - **Scientific programme for HEP, nuclear, QCD, structure of matter ...**
 - **Experimental programme, i.e. what experiments/facilities are required**
 - **Test case for nuSTORM among the relevant peer group through this process**

IPPP/NuSTEC topical meeting on neutrino-nucleus scattering

Durham, 18th to 20th April 2017

Neutrino-nucleus scattering is a critical input to present and future neutrino experiments. Uncertainties related to $\bar{\nu}A$ cross sections make a substantial contribution to the systematic-error budgets of, for example, T2K and NO ν A, while hadronisation uncertainties need to be addressed in sterile-neutrino-search experiments such as MicroBooNE.

The future sensitivity of DUNE and Hyper-K will be no less sensitive to our understanding of $\bar{\nu}A$ scattering. The statistical weight of the data sets collected by each of these experiments will be such that uncertainties on the cross-section themselves and the uncertainty on the $\bar{\nu}_e A$ to $\bar{\nu}_\mu A$ cross-section ratio must be reduced to the percent level. Such precise knowledge is required not only to manage the overall systematic uncertainty but also to avoid biases in the oscillation parameters extracted from the data. Evidence for CP-invariance violation (CPiV) will be sought by measuring the rate of $\bar{\nu}_e$ appearance in a $\bar{\nu}_\mu$ beam. Therefore, a lack of understanding of $\bar{\nu}_e A$ scattering will be a pernicious source of bias or uncertainty in the interpretation of any evidence for CPiV.

The measurement, theoretical understanding and phenomenological description of $\bar{\nu}A$ scattering are each challenging. To understand $\bar{\nu}A$ scattering in sufficient detail for the future neutrino-physics programme to reach its full potential will require the effective collaboration of experimenters, theorists and phenomenologists. Indeed, in the energy range of interest, the combined expertise of nuclear and particle theorists and phenomenologists will be required. Such a collaboration is also likely to generate new insights into long-range QCD and nuclear phenomena.

The IPPP therefore invites you to a topical workshop on neutrino-nucleus scattering, which is to be held in Durham from the 18th April 2017 to the 20th April 2017. The goals of which will be to:

- Take stock of the current status of $\bar{\nu}A$ scattering data, the nuclear and particle theory through which it is understood and the phenomenological description of the cross sections and hadronic final states;
- Discuss the programme of measurement, theory and phenomenology required to develop an understanding commensurate with the future neutrino-physics programme; and to
- Evaluate the path towards “global fits” that can be used to make reliable predictions of neutrino-nucleus scattering.

The workshop will be organised jointly by the IPPP and NuSTEC and will include discussion, and appropriate development, of the NuSTEC white paper on neutrino scattering. The desired output of the workshop is a short document in which the status of the field is briefly reviewed and the way forward—experimental, theoretical and phenomenological—is outlined.