Osaka Meeting Overview:
Progress and Issues

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NFMCC Friday Meeting
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Outline

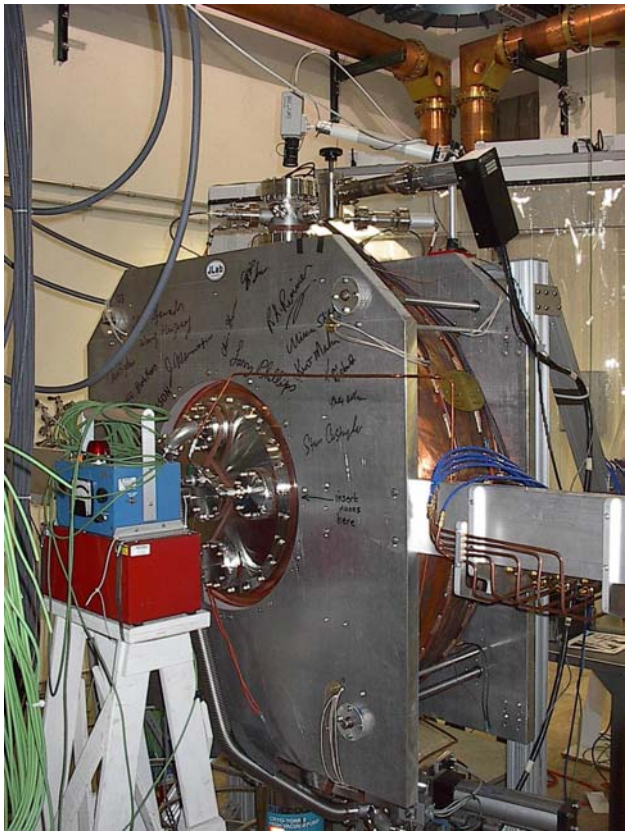
- Progress since Frascati meeting
- Meeting Plans
- Meeting Goals
- Issues from Technical Board
- Beam Line Issues
- Cooling Channel Issues
- Detector Issues
- Simulation Issues
- Controls/DAQ Issues
- Final Remarks

Progress Since Frascati Meeting

- **Progress on many fronts is encouraging**
  - PSI (decay) solenoid arrival
  - spectrometer solenoid purchase moving forward
  - 201-MHz cavity testing now under way (reached 16 MV/m!)
  - RF power source refurbishment under way at Daresbury
  - asymmetric heating of Be windows estimated and looks okay
  - progress on tracker design and definition of PID approach
  - hydride bed ordered (delivery in May)
  - new group (Kyoto) accepted into collaboration

Cavity Ready for Testing

4616HT power supply being built at Daresbury for May 2006 test



201-MHz cavity at Fermilab MTA

Meeting Plans

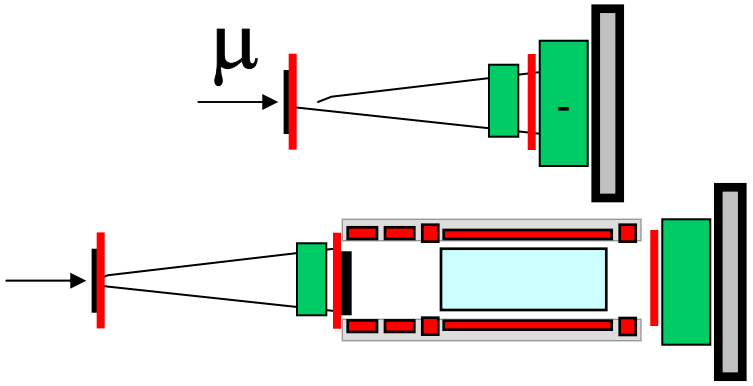
- Plans for upcoming MICE meetings
  - June 8-11, 2006 at Fermilab (changed due to EPAC)
  - October 8-11, 2006 at RAL
    - in future consider two meetings at RAL, one elsewhere

- Plans for upcoming ISS meetings
  - April 25-28, 2006 at RAL (with BENE)
    - Accelerator Group workshop April 21-24, 2006 (also RAL)
    - Accelerator Group workshop May 20-22, 2006 (BNL)
  - August 21-22, 2006 at UC-Irvine

Meeting Goals

- **Where are we on preparations for Steps 1 and 2?**

- **Issues**
  - beam line, target, optics, tuning/correction algorithms, diffuser
  - TOF, CKOVs, MUCAL, tracker, spectrometer solenoids
  - trigger, DAQ, controls/monitoring
  - software (PID, reconstruction)
  - analysis (run plan, "beam" reconstruction, emittance, transmission)
  - installation/cabling



PHASE I

STEP I:
April 2007 = 394 days away!

STEP II:
October 2007

Issues from Technical Board

- Power requirements need to be defined precisely
  - especially cryocoolers (about 10 kW per unit)
  - need efficient operation plan to stay below 700 kW (if possible)
- ISIS production target test schedule is tight
  - test vibration, vacuum, reliability issues well before June run
  - investigate commercial solution for 40 A programmable current source
- Need to "freeze" beam line front end
  - hold review by mid-April
  - generate standard files for G4Beamline
- Need sign-off on main features of Hall layout
  - ask for written list of objections/omissions
  - aim for formal sign-off at next Tech Board meeting

Beam Line Issues

- Get safety sign-off on shielding approach by April
- Explore use of collimators, e.g., for "pencil" beam
  - Understand what happens to collimated particles
- Explore use of ISIS target station 2 correctors
  - can we piggyback on their order?
- Define tolerances (alignment, field strength, field quality) for all elements
- Define diagnostic needs for beam line
  - need to beef up optics effort

Cooling Channel Issues (1)

- **Magnets**
  - decide on AFC changes and formalize (e.g., using cooling pipes rather than liquid cooling)
    - is this needed for all magnets?
  - formalize maximum force design values (50 → 70 tons)
    - implies bigger heat leak
    - add low-field polarity check to operational procedures
  - formalize adoption of pulse-tube coolers rather than GM
    - requires vertical mounting and shielded rotary valve
    - prefer use of pulse tube cooler for H_2 R&D system!
    - note that compressors also need to be away from magnetic field
  - decide on proper interface between AFC module and absorber
    - use dummy absorber
    - use pipe template for absorber fabrication
  - design must be done by end of 2006
    - develop milestones to reach this result

Cooling Channel Issues (2)

- H_2 R&D system
  - complete and document formal HAZOP process
  - evaluate practicality of non-flammable MLI
  - avoid creating hydrogen zone in experimental area

- RF
  - method to measure voltage at 1% level is not in hand
    - likely to require beam-based measurements to achieve this

Detector Issues (1)

- Need to resolve—and get buy-in—on technical decisions
  - sandwich calorimeter vs. KLOE design
    - do we need one KL layer, or all plastic?
  - need for CKOV2 (almost ready; probably not needed)
    - need to document case better
  - design for CKOV1 (ring imaging?)
- Finalize spectrometer solenoid spec by mid-March
- Need plan for final magnetic mapping with field sensors
- Need to pay more attention to QA/QC
  - wiring errors
  - connector misalignments
  - build a fifth station using full QA procedures

Detector Issues (2)

- Understand 201 MHz RF backgrounds
  - has implications for operation of AFE IIt board (count rate capability)
  - MTA tests with Coupling Coil would go a long way toward answering which regime we'll be in

- Consider need for dual Fe shields at TOF2 to lower B_r
  - a non-trivial perturbation on present design, if needed

Simulation Issues

- Understand predicted lack of cooling with large ΔE
  - consultation with Palmer and Fernow recommended (at RAL in April, or earlier at BNL?)
- Evaluate use of TOF2 to constrain timing at RF location
- Resolve discrepancy between ICOOL acceptance and analytic estimate

Controls/DAQ Issues

- Develop trigger scheme
- Specify/evaluate all required hardware, especially front-end electronics
  - assemble a test system
- Finalize DAQ scheme at Fermilab (CM15); approve at RAL (CM16)
  - architecture: PC + VME + Ethernet
- Need PID + track reconstruction algorithms for Step 1
  - also front-end electronics specification (late!)

Final Remarks

- We continue to make progress but some things are moving more slowly than hoped
- Be vigilant about opportunities to publicize MICE
  - muon program got good press at HEPAP AARD Subpanel
  - need to think about journal publication(s)
- MICE management continues to be grateful for the hard work of the collaboration
- Now 394 days to target date for first beam
- See you at Fermilab ☺