Closing Remarks

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MICE Collaboration Meeting 28—Sofia
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Outline

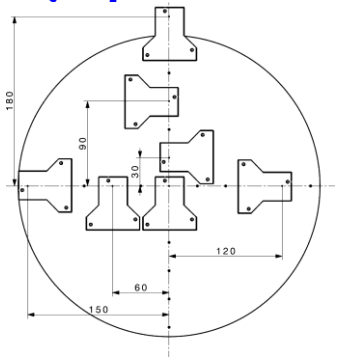
- Goals for This Meeting
- Technical Board Issues
- Detector Issues
- Software Issues
- Magnet Issues
- RF Issues
- By Next Meeting
- Final Remarks

Goals for Meeting (1)

- Look at Step 1 data
  - have we achieved goals? ✓
  - what is the path to publication? ✓
- Review run organization
  - MOMs cf. "responsible persons"; software reorganization ✓
- Prepare for 2011 operations
  - complete Step 1 items
    - PPS, off-line target ✓/2
    - EMR, spectrometer solenoids ✓
    - expedite magnetic measurements ✓/2
- Prepare for 2012 operations
  - step 4 cf. steps 3, 3.1 ✓
- Hardware readiness
  - schedules for Sp. Sol., EMR, AFC, LH_2, RFCC, RF power ✓/2
- NuFact10 preparations

Goals for Meeting (2)

- **Step 1**
  - why are e^+ and e^- different?
  - fix tilted detectors (avoid "leaning towers of Milano")
  - need rates at each setting of ε-p matrix
- **2011 operations**
  - PPS still not quite ready for prime time (need help from John Alexander)
  - magnetic measurements
    - proposed scheme seems workable and affordable
    - we have not yet defined precisely what we want and need
      - *written* requirements document required to finalize plans
  - do we need a QA/QC plan for software development?

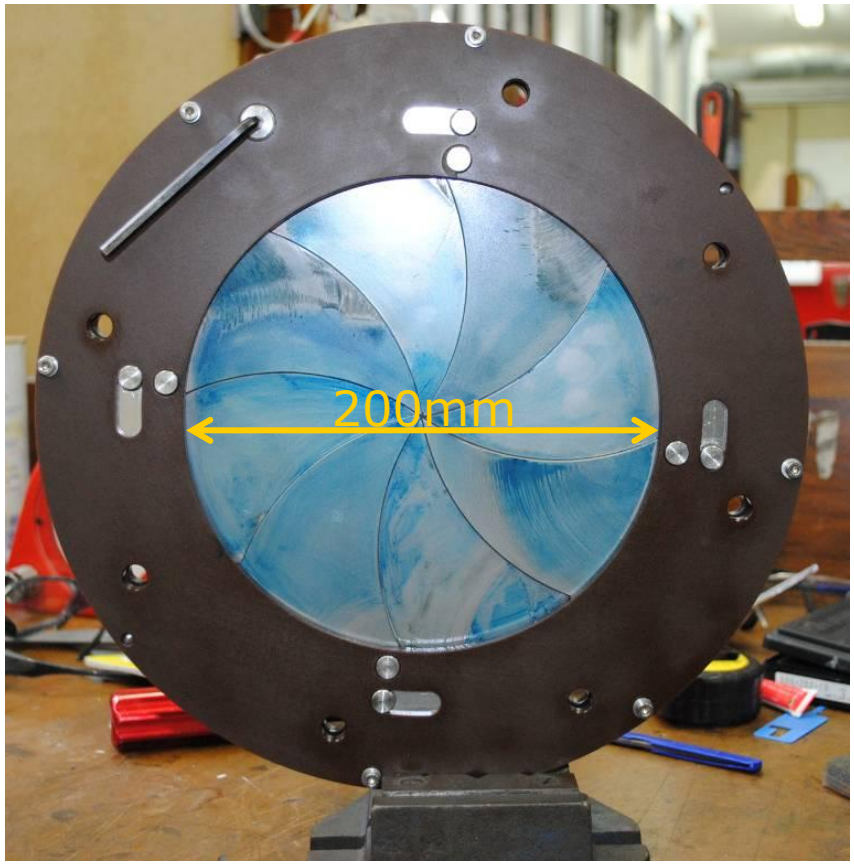


Goals for Meeting (3)

- Hardware readiness
  - plans for spectr. solenoids firming up; not yet documented or reviewed
  - similar comments apply for CC cryostat and RF power
  - quench protection scheme for FC is settled
  - FC winding still has not started, hopefully imminent
    - has now slipped ~1 year
  - RF cavity fabrication completed (early!)
    - embarking on critical vendor test of electropolishing
  - MICE Project Board is requesting "hardware-complete" date
    - after which we are fully in data-taking phase
- NuFact10 (and PAC11)
  - still doing preparations at last minute
    - better late than never
  - need involvement of Editorial Board at earlier stage

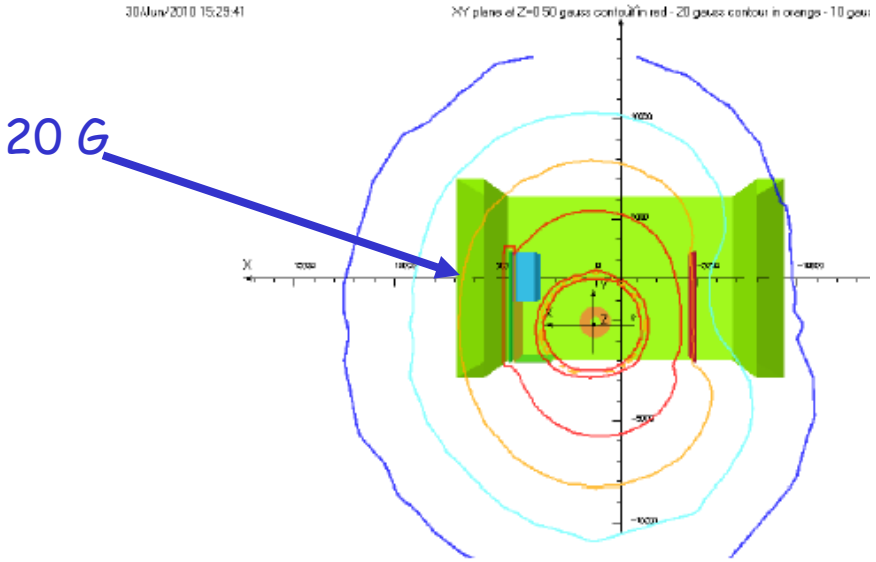
Technical Board Issues (1)

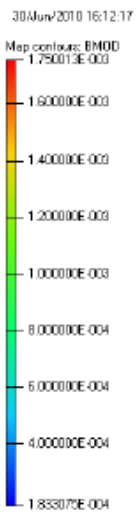
- **Modified diffuser**
  - concept well received
  - must define acceptance criteria for it
    - at a minimum, need complete assembly drawings to review

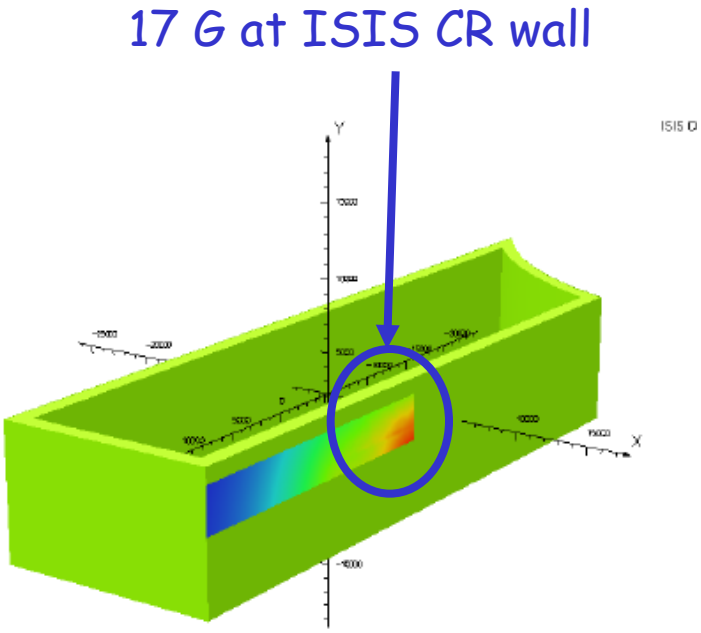


Technical Board Issues (2)

- **Error found in original magnetic field estimates for MICE Hall (Courthold)**
  - **step 6 issue (only in "solenoid mode")**
    - **fringe fields in MICE and ISIS control rooms now much too high**
      - **up to 19 G for 240 MeV/c case (want <5 G)**
  - **working on solution**
    - **does not look easy!**







Technical Board Issues (3)

- **Integration effort**
  - Jason Tarrant pulling this together
    - a welcome addition that will benefit all of us
  - change control process being revisited
    - need single, well-defined process
      - need simplified 3D envelopes and services routes for all devices
  - hydrogen test system needs monitoring
    - can we put it in final location initially?

Detector Issues

- Detectors in general working beautifully!
  - TOFs are working above and beyond the call of duty
- EMR has gained weight
  - need to revisit support structure
  - in light of updated fringe field estimates, should reexamine shielding and force estimates for this and other downstream detectors
- Need to correct "tilts" in TOFs and KL
  - nice job of identifying and quantifying problem
- Need to document all survey information for components
  - Matt Littlefield working on this
    - recognition that different coordinate systems exist
      - developing the means to handle this
- Understanding e^+-e^- difference is important
  - will selecting a "pencil beam" help anything?

Software (1)

- **G4MICE**
  - both simulation and data reconstruction package
  - Chris Rogers has taken ownership of development
  - plans include:
    - global reconstruction
    - calibrations
    - simulation of MICE experiment (tracking ⇒ energy depositions)
    - models of detector response (energy depositions ⇒ data-like MC)
    - physics analysis tools
    - data quality check
    - fast simulation of MICE (matrix formulation)
    - event display
  - impressive list requires some prioritization, milestones (and extra help!)
    - geometry also part of the job and must be closely linked
  - simulation of Step 1 needed for full understanding of our results
  - must start simulation of steps 3 and 4 to develop run plan

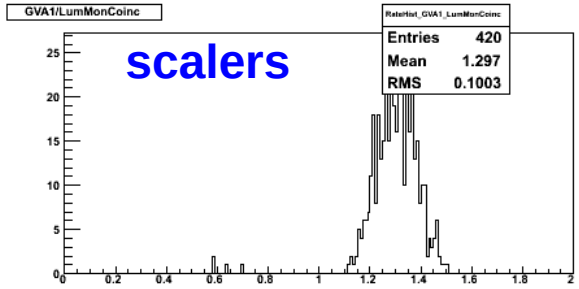
Software (2)

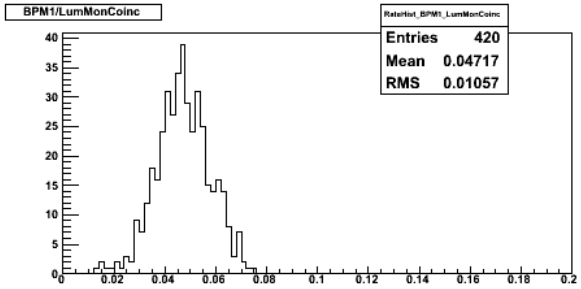
- On-line reconstruction (Linda Coney)
  - many beautiful plots on line
  - extremely useful for shifters
    - continued requests for more features
      - concentrate on data quality ⇒ error bars needed
        - e.g., scalers, good muons per lumi hit, beam position and size
        - emittance estimate is good, but only if the rest is correct
      - get tracker requirements
      - add history plots
      - capability for "correlation" plots useful for debugging
        - these need access to history data also
      - be able to tailor to specific measurement needs
      - integrate with new software structure
- How do we keep on-line hardware operational?
  - debugging tools and/or system expert

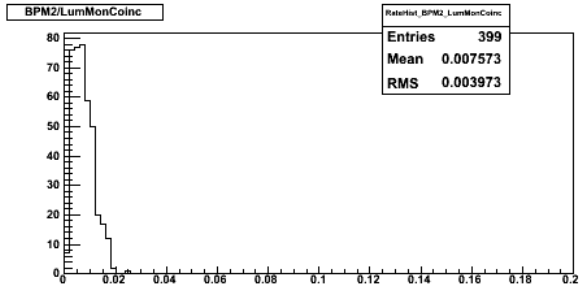
Software (3)

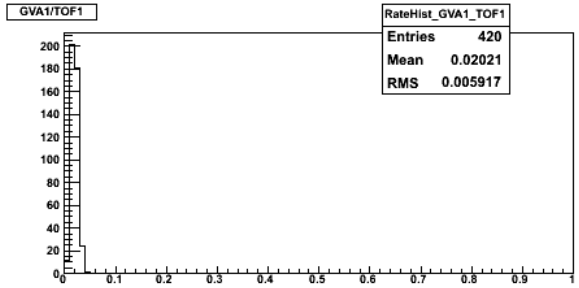
- Examples of plots needing error bars

scalers

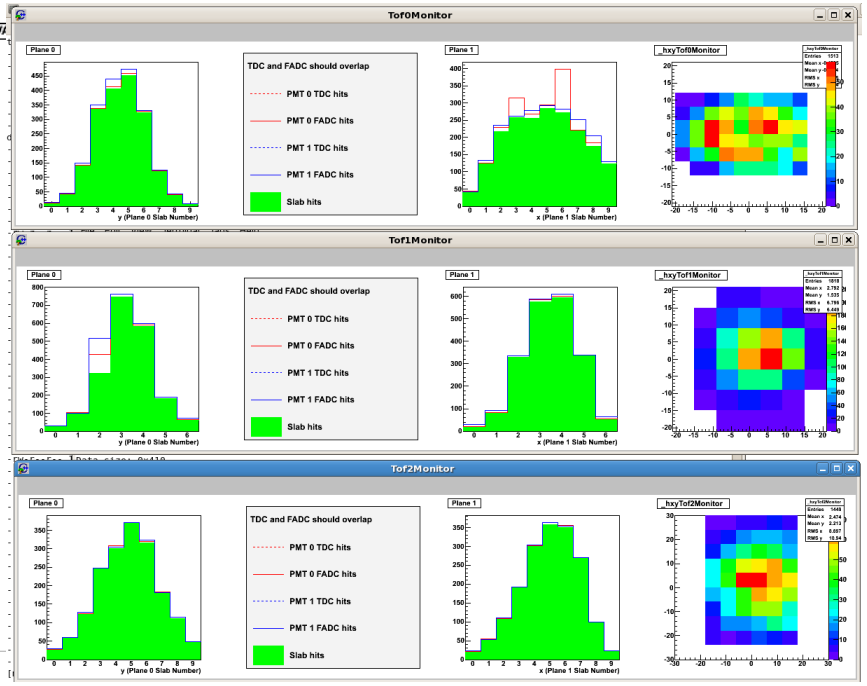








profiles



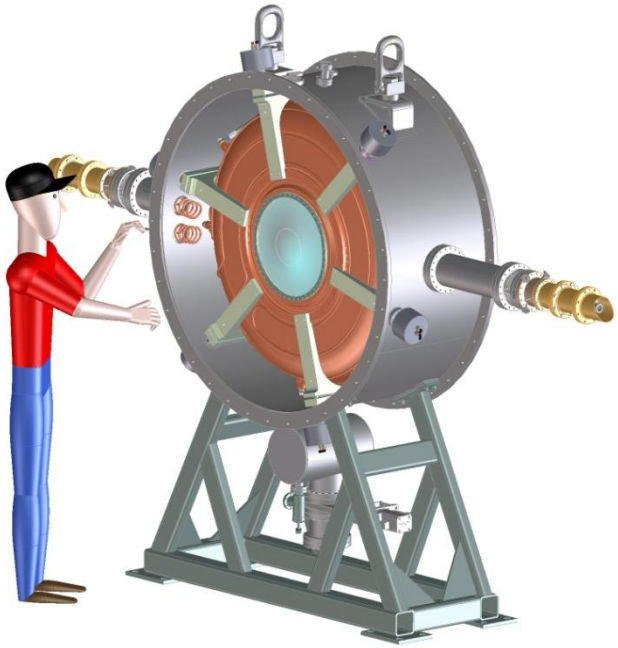
Magnet Issues

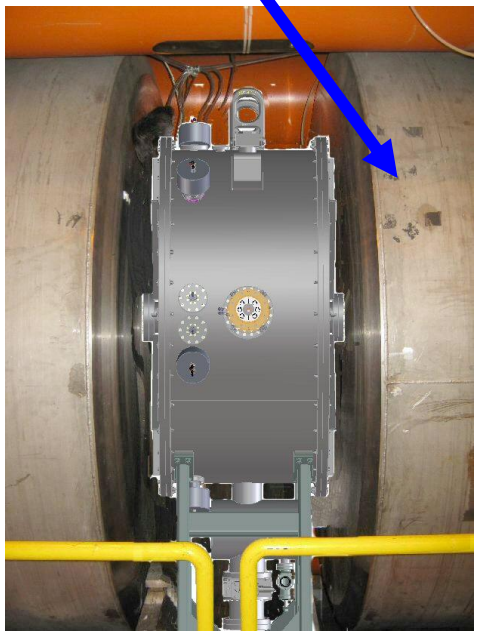
- Brackets for Virostek plates deemed inadequate
  - need to beef up or remake
    - Lau to advise on options and revise drawings
- Need review of plans for spectrometer solenoid repair by magnet reviewers and Technical Board
  - fabrication drawings for original design and proposed modifications
  - thermal estimates to justify modifications
  - QA plan
  - schedule with realistic float
  - moving forward, but seeing is believing
- Need to refine vacuum plans
  - need adequate monitoring of insulating vacuum
    - not easy in magnetic field; perhaps remote, shielded gauge
  - need adequate pump-out port (at least 40 mm)
  - develop layout for continuous pumping of all magnets in case it is needed
    - big (remote) pumps and big pipes

RF Issues (1)

- Remaining 5 cavities ready for delivery to LBNL
  - in advance of scheduled date
    - a non-standard event, to say the least
  - concept for test vessel developed
    - could be used at MTA, CERN, or RAL

RF cavity test plan needed!





RF Issues (2)

- Clearance for CC shield is driving possibility of design change for (some) RF couplers
  - proposal to change inner cavity coax lines from 4-1/16 in. to 3-1/8 in.
    - some concerns about different cavity arrangements and power limitations
      - neither is thought to be a major problem
  - alternative of lengthening module by a few cm also raised
    - Ulisse Bravar will look at optics effects of increasing length
      - expected to be minor, but need to see how magnet requirements change
    - if this looks plausible, need Tim Hayler and/or Jason Tarrant to assess infrastructure impacts

- Whichever way we decide to go, a formal change control process should be used to guide and document the decision

By Next Meeting

- Develop complete understanding of Step 1 data
  - continue efforts to study increased intensity/beam loss regime
  - produce first MICE paper (need to precisely specify its content)
- Simulations of measurements needed for Steps 3-4
- Resolve external field issue for Step 6 solenoid mode
- Fully define magnetic measurement needs and plan
  - in writing!
- Review and approve spectrometer solenoid repair plan
- Complete, review, and approve CC cryostat design
- Assess progress of CC cold mass fab + HIT test facility
- Prepare test plan for RF cavities
- Monitor progress on EMR fab and impact on infrastructure
- Put official slide repository into operation

Final Remarks

- This has been our most successful running period ever!
  - thanks to MOMs, BLOCs, shifters
- MICE management is grateful for the continued hard work of the collaboration
  - pleased to see the younger members giving talks, taking responsibility, and delivering!
- Please continue to support Andy Nichols
  - cooperate with requests in a complete and timely fashion
    - we need to get management of the project on a more solid footing
- Be vigilant about opportunities to publicize MICE

Acknowledgment

- **We are starting to lose some of our most valuable contributors to the software effort**
  - **MICE will be poorer for their absence**

Kudos

- Thanks to Roumen Tsenov, Yordan Karadzhov, Galina Vankova, and Linda Coney (CM28 organizers)
  - for a well-planned and well-organized meeting…and a great dinner!

- Thanks to Vassil Verguilov and Mariyan Bogomilov
  - for serving as "shepherds" and tour guides

See you at RAL! ☺