MICE Meeting: Final Comments/ Action Items

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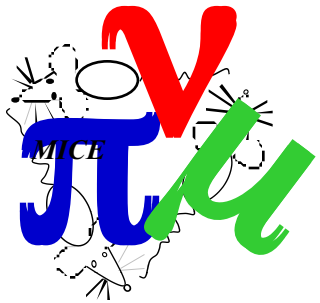

MICE Collaboration Meeting
Rutherford Appleton Laboratory
November 2, 2003

First, let me say . . . ,

- **Thanks to all for an excellent meeting !**

- **Your hard work and good ideas**

→ lots of progress !

Action Items:

1. Beamline (Palmer, Roberts, Tilley):

Simulate & understand beam more thoroughly

- Optimize additional focusing elements: quads or solenoids? ∃ magnets or new?
- Effect on quads of spect. solenoid stray field?
- Singles rate estimates in TOF0,1 ⇒ needed segmentation
  - proton/neutron absorber needed?
- Do TOF combinatorics or pathlength variations require "TOF tracker"?

2. Magnets (Barr, Green, Fabbricatore, Gregoire, Rochford)

Need to iterate latest configuration → worst-case forces and stray fields

- How thick Fe *B*-shield box? Need extra layer? Need a roof?
- Are Fe disks at ends of spectrometer solenoids desirable? Cost-effective?
  - Is reduction from 0.6 T to 0.2 T needed with fine-mesh PMTs?
  - What effect on B_z uniformity vs. *r*?
- Work through magnet measurement & alignment issues
  - MICE RAL proposal says we will measure *in situ* field of each coil separately

  ... but current plan is to connect them in series!?

3. Tracking (Ellis, Sakamoto, Yoshida, et al.; Gastaldi, Radicioni, et al.):

Decision: baseline remains SciFi (unless performance shortfall demonstrated)

- Need to finish SciFi analysis and document results (by end 2003?)
  - adequate light yield, dead channels, resolution?
- Should complete TPG R&D & publish
  - possible backup or upgrade if needed

4. PID (Bonesini, Gregoire, Summers, Tonazzo):

- Need complete calorimeter design
  - finish optimization for 200±80? MeV/c
  - impact of aperture cuts on ε measurement?
  - can overcome Pb tooling size limits? increase aperture with side-by-side spaghetti modules?
- Need engineered layout of solenoid cryostat & detectors
- Need G4MICE sim of PID performance

5. Absorbers (Barr, Baynham, Black, Ishimoto, Lau, Zisman):

- What is design heat load?
- Can vac. & abs. windows be same size & design? What is profile of "stay-clear" zone?
- Demonstrate seal or weld with acceptable leak rate
- Need "what if" failure analyses (effects of quench, small leaks, can window burst?, etc.)
- How assure window integrity after handling?
- How detect leaks into absorber vacuum?
- H_2 storage: hydride bed or tank?

6. RF (Church, Li, Moretti, Virostek):

- Can cavities and supplies be compatible with LN_2-temp operation?
- How actuate tuners in high radiation and field?
- Do we need/can we afford circulators? Or are hybrids sufficient?
- ∃ add'l useful surplus equipment? Can additional suppliers (Russia, e.g.) reduce cost?

7. Systematics (Bravar, Errede, Palmer):

- Measurement & instrumentation
  - how well can we measure absorber length & density?
  - how well can we measure accelerating field?
    → good projects for training students
- Emittance analysis
  - are rms emittance differences meaningful to 1% of 10%?
  - can emittance of non-Gaussian beams be defined/calculated more precisely?
  - effect of (lack of) correlations in incoming beam on needed statistics

8. Software (Kahn, Tonazzo, Torun):

- see http://www.mice.iit.edu/software/actionitems.html (& sim items above)
- develop & code more realistic photon-bkg model
- when/how merge G4MICE and g4beamline?
- improve cal PID algorithm

9. Infrastructure & Integration (Black, Ivaniouchenkov, Lau, Virostek, Zisman):
   - use cryocoolers or centralized compressor/fridge?
   - surplus refrigeration plant avail?
   - how shield against RF-cavity radiation? (need blockhouse or not?)
   - lots of detailed issues:
     - how design flanges, how communicate magnet forces, how align, what tolerances needed...?
     - how (& why?) design Pb "gate valve"? (or Hevimet? or Pt?)
10. Improve understanding of costs and budgets (Drumm):
   - **This is urgent and important!**
   - Need estimates of item costs & contingencies prior to Dec. 12 Gateway 1 review
     - total MICE cost including escalation, VAT, 30% contingency looks surprisingly high
     - are contingency estimates multiplying inadvertently?

       ⇒ need to eliminate any "hidden contingency"
   - Help Paul help us all - give him your best input ASAP!
11. Attracting more collaborating institutes could help, esp. in Europe:
   - Let Exec Bd know of contacts you may have
   - Give lots of MICE seminars!

Peach seems confident:

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