MOLLER Closeout

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This talk primarily highlights action items related to the upcoming review.

This is an edited version from after the meeting, based on notes from the discussion at the end of the meeting. We identified items in **RED** as near-term **action items** and Mark/KK assigned some names to follow up on them.

Bob McKeown talk

- Upcoming Director's Review
  - CDR? – presumably our updated proposal serves this role?
  - Preliminary Project Execution Plan – this is broader in scope than the SBS PMP we have been modeling after so far

Hall A Report (Thia)

We need to develop a comprehensive systematic uncertainty chart well before the technical, cost, and feasibility review!

- *Sub-system by sub-system*
- *All parameters*

Different from Key Performance Parameters

Action item: Many of these things exist, but in various places in the proposal. Pull them out into some succinct tables. (Mark, KK)

Spectrometer/Toroid Engineering

- Stick with baseline hybrid coil design through this review (don't deal with multiple coil magnet idea till after the review)
- Baseline design looks ready for this review
- Question about 1 mm position tolerance for key collimators – KK indicates we will have diagnostic ways to determine this – we should clearly lay that out somewhere in this review

Action item: Question raised about how much floor will move with the heavy shielding, etc. Key components to worry about are the primary photon and acceptance collimators. We should try to assess how much they might move and determine if any sort of monitoring system is needed for them. (Javier, KK, Rakitha)

2 loop calculations

- Presumably that is not part of this review since it was part of Science review

Action item: KK has requested that the theorists set up an internal review sometime in the spring to review the status of this. (KK)

Polarized beam

- Science Review report explicitly mentioned the helicity-correlated size difference, so we need to present a clear plan in this review
- KK: can Kent improve spot size bounding to better than 10^{-4} by "a few"? (need to talk about further offline)
- Do we need the injector upgrade (200 kV gun + ¼ cryo) to do MOLLER? Does this need to be a dependency?

Action items:

- **Look up article Jay had found about using MCP to monitor spot size variations to assess if it is relevant technology for us to monitor helicity-correlated spot size. (Jay, Kent, Mark)**
- **In the updated proposal, need to revise 2nd order beam parameters based on the new target to primary collimator distance (6 m instead of originally assumed 10 m) (Kent, Mark, Gordon)**

Beam monitoring

- Need to also prepare specifications for beam current/position monitoring for low current beam as well

Action item: Prepare these specifications for the updated proposal. (Mark)

For both Polarized Beam and Beam Monitoring

- Make list of beam tests for source and monitoring

Action item: Prepare this list prior to Fall 2015 running (Mark, Kent)

Target

- Appears adequate for technical feasibility demonstration based on the extrapolations done in the original proposal by Greg Smith and the subsequent validation of many of those estimates by Qweak

Action item: Review the extraction of target boiling widths vs. frequency in slide 12 of Silviu's talk, particularly the highest frequency point (Silviu plus Mark and/or Kent and/or David)

Collimation/Shielding

- Need to refine the estimates of "beamline/collimator" background that hits focal plane
- Shielding for hall background radiation: likely won't have a complete shielding design that satisfies all our requirements, but show them where we are at

Action item: Goal for Nov. 1: Get gamma, neutron, electron rates at focal plane from 2-bounce backgrounds (Rakitha, KK)

Detectors

- Primary thin quartz detector; assuming we have a clean environment we have a baseline detector design that works including demonstrated prototype
- Shower max; baseline design looks adequate for now; good enough for review
- Pion detector: decide after background meetings if/when we need baseline design

Tracking/GEMs

- Need to put the Sieve idea into CAD – it will be moveable in and out and located just upstream of the acceptance defining collimator
- GEMs; nice detailed plan of things to do before review; Stony Brook willing to put holding fixtures/rotating wheels into CAD but needs to do it on request and can't drive the process

DAQ

- Important to emphasize the 100% prompt analysis for review
- Is there any intermediate test we can design for this to call out as a plan for the review committee?

Backgrounds

- Task of ad-hoc Backgrounds Working Group – Armstrong (chair), KK, Michaels, Paschke, Pitt, Riordan, Souder

Action item: Get this group going soon. Ideally need a write-up by Nov. 1. Rough schedule:

- **September: initiate work on inelastic e-p and Al; at end of month assess our timetable**
- **mid-October: Ask people to review the results: Horowitz, Donnelly, Ramsey-Musolf, Bosted**
- **Ideally prepare a write-up (incorporating the reviewers feedback) by Nov. 1**

Polarimetry

- Compton: For external review Compton polarimetry story looks good based on Qweak experience (internal discussion about Hall A Compton electron detector status and fallbacks)
- Baseline polarimetry plan doesn't include atomic hydrogen, but R&D continues for it and it is a potential deep fallback
- We should have a cross-check plan between Moller and Compton for Hall A planned and defendable for the review