Weekly Report – week of October 24th, 2011
Fabrication and Assembly of ERL hardware
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Controls: Software development continued for the temperature interlock system that will provide an input in the Machine Protection System. As part of the general preparations for this week's RF cavity test, digitized loss monitor readings were set up for two PMT's, Ion Chambers, and Heliax-type BLMs via newly installed equipment.

Cryogenics: The cold test of the ERL 5 cell cavity required support for the N2 pre-cool in preparation for the 4 K cooldown then subsequent 2K cooldown to required operating temperature. This was all done to support the cavity tuner feedback commissioning, other LLRF tasks and further studies of micro-phonic noise.

ERL injection line: We're currently reconfiguring the waveguide to address an interference with the gun cryomodule.

Gun Cryomodule/5-cell cavity: With the roll out of the cavity string from the cleanroom, the FPC bellows have been welded on and leak checked. Survey data has been taken of the final string assembly and transferred to monuments that can be accessed on the outside of the cryostat. The tuner is being mounted and the cavity frequency tuned to set the tuner at the nominal position.
The 5cell cavity was successfully cooled down and the LLRF and tuner modes checked.

Instrumentation: The four halo scrapers are being processed by the vacuum group. Two of the four passed the particulate check; the other two will need to be cleaned as they just barely have elevated counts. We have received the hole matrix pepper pot heads from Radiabeam, they will be inspected by microscope and tested with laser light. An engineer will be visiting the Radiabeam facility next week to witness the final testing of the 4 profile monitor station being prepared for delivery. The BLM VME chassis Controls interface integration effort continues, some extra attention is need for the configuration of a few VME modules. The DCCT system cable extension bench tests were conducted, the data is being reviewed, and so far no significant detrimental effects have been recognized. A quote has been received from I-Tech for the remaining needed Libera BPM electronics modules for the ERL Loop transport, the PO will not be placed until a later time.

Laser: Tested laser locking to the ERL low level RF (LLRF), determined that LLRF signal needs further conditioning. The LLRF cable connection between the control room and Laser room should be replaced by Heliax LDF1-50 or similar. Work continues on fourth harmonic generation tests and simulations: UV absorption in KDP is causing thermal problems, beginning tests with BBO crystal. The BBO Low power performance is consistent with the simulation. In-vacuum laser mirror

mounting issues are resolved, and the mirror will be mounted when the high purity nitrogen is restored in the clean room.

Large Grain Gun: A final resource estimate has been submitted to Project Controls that includes, among other things, a quotation for the fabrication of the copper vertical test cathode from AES as well as other project tasks. The top plate for the dewar has been moved into the cleanroom, and we will commence assembly of the vacuum system as soon as the final parts arrive. Arrival is expected in about a week.

Mezzanine: The mezzanine height adjustment has being completed. We continue to receive delivery of parts for the clean room that will be constructed under the mezzanine.

Photocathode: [Metal Cathode Laser Cleaning Chamber] The installation of the cold cathode gauge and gauge controller is complete. The Cleaning Chamber was leak checked and found to be leak tight. All components have been mounted and secured on the provided laser breadboard using banding straps and cross mounts. The Cleaning Chamber and electronics were moved to Instrumentation to clean the copper substrate with an Excimer laser. [Deposition System] All nut plates and bolts will be replaced with silver hardware to eliminate the use of anti-seize compound. The gasket parts list was provided to the vacuum group so they can be ordered. The main chamber reassembly is underway. All source arms have been cleaned and baked and are now being reassembled for leak check by the vacuum group. High temperature cold cathode gauges have been received to replace lower temperature specified originals.

Vacuum:

1. Detail design of the ERL zig-zag chambers continues. Drawings have gone through engineering checking with minor edits to incorporate. Procurement documents are complete and released, including the PO with spec and SOW attached. Awaiting signed-off drawings to issue RFQ.
2. Survey has marked the Laser transport beam line and optics tower. All components staged and are waiting anchor drilling which will be followed by transport line installation.
3. The laser mirror assembly is ready for assembly with the new ring shims. A test assembly method with test mirror was performed and accepted for use with the actual mirror. The assembly is scheduled for afternoon of 10.28
4. Particle free QA complete on both pepper pot assemblies. One of the pepper pots prepped for 200C bakeout. Scheduled for 10.31 start.
5. Four halo scrapers have undergone preliminary particle free QA in the 905 clean room. 2 will require disassembly, precision cleaning and ultrasonic wet processing of the welded bellows.
6. Bake out system schematic for e-gun prepared.
7. The gun has been turned over to the vacuum group for bakeout. Thermocouple and heating tape installation has begun.
8. The large grain cavity assembly is underway in the clean room.

9. Working with vendor to provide HOM ceramic break with the high resistance coating. Design of an alternate e-gun HOM Damper impedance bridge between the ceramic and metal cuffs continues. R& D may not be available for coating until after RHIC shutdown
10. Mechanical assembly continues on two new turbopump stations to support ERL vacuum work.
11. Deposition chamber parts all cleaned, vacuum fired and or baked and ready for assembly