

Weekly Report – week of February 14, 2011  
Fabrication and Assembly of ERL hardware  
PI: Ilan Ben-Zvi, Brookhaven National Laboratory

**Cryogenics:** The installation of the cryogenic transfer lines along with wiring of level and temperature sensors to support the ERL and VTF cryo refrigerator is making good progress. The piping for pulling vacuum and recovering helium also is being installed.

**Laser:** Low power alignment of autocorrelator. The need for supplementary air conditioning has been discussed and quotes have been requested for necessary upgrades to the laser room.

**Photocathode:** Drawings for the modification of the UHV cathode transporter are being finalized along with ordering of parts. Multiple evaporations of antimony have been made in the deposition system with mixed results depending on the material deposited on. Evaluated SEM results on antimony deposition on various substrates. Plans laid out to evaporate on SS sample following the latest procedure.

**Gun Cryomodule:** ballast tank insulation and its heat shield have been installed. The gun cavity / helium vessel assembly has arrived at BNL and has been unpacked and inspected. String mock-up is underway.

**Gun FPC testing:** The Navy FPCs are on the test cart and are being readied for testing. The water-cooling lines are hooked-up along with the temperature sensors and flow switches. The waveguide and remotely operated phase shifter are ready along with a monitoring camera. The work planning for the testing is complete and we await the PASS systems certification allowing the use of the 1MW Klystron.

**PASS System:** a modification is in progress to allow operations of the 1MW Klystron and the FPCs in the ERL Block enclosure. The additional wiring and modifications are in review, along with testing of logic and re-certification of the ERL PASS System. The PASS system for the LBH had power turned on allowing circuit testing with certification to follow. The VTF PASS system is making good progress with many of the electrical boxes being installed and stuffed with wiring and control circuits and switches.

**Mezzanine:** proposed modifications have been finalized along with a proposed clean room area. A statement of work is being reviewed and comments being considered.

**Large Grain Gun:** 28" Dewar and the top plate have been discussed with drawings completed of how to install Large Grain Gun into the dewar for vertical testing. Discussions on how to mount the 28" dewar on a plate with wheels and a support frame for assembly of the top plate have also been discussed. The layout of the cavity inside the dewar is nearly complete. New RF window for the input coupler is designed.

**5-cell cavity/cryomodule:** Simulations show that NbTi flange with AlMg seal is not suitable choice for CW operation of the 5-cell cavity due to thermal run-away. We are in the process of identifying new flange design options.

**ERL injection line:** Vacuum envelope is in preparation to final review, small quadrupoles have been built, correction magnets are under design

**ERL Extraction line:** Magnets are being fabricated, beam dump pressure vessel code compliance under evaluation, vacuum/instrumentation layout needs to be reviewed and finalized.