Weekly Report – week of July 18, 2011
Fabrication and Assembly of ERL hardware
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**Cryogenics**: Transfer lines cryoplant side: Weld inspection: Weld inspector was not available till next week. Review with technician for completion of N2 shield vent and 1" relief lines for Vertical Test Dewar, 1/2inch cooldown return lines connection to cryoplant return lines from subcooler, liquid helium dewar.
Local dryer bed came in for the compressed air line for instrument air for cryoplant. Needs to be installed in next few weeks.

**Controls:** Kepco power supply testing has been postponed until the power feed to the local breaker panel has been set up, though work on the software interface continues unabated. VME DAC and ADC modules have been installed for the BiRa power supplies after authorization was granted to make use of the limited supply of equipment already on hand, rather than wait for newly purchased units to arrive. Testing of the image processing software that is integrated with the camera data acquisition system is underway.

**Instrumentation:** The injection zig-zag plunging profile monitor design continues to improve with stiffened YAG supports and efficiencies made in the actuator design while the enlargement of the port is under consideration. Continued acceptance testing of the first YAG/OTR profile monitors from Radiabeam now shows good conformance of target focus control thanks to a technique employed to project a high resolution target image in UV onto the YAG crystal. In house digital camera management software proves to be an asset in managing the many beam imaging cameras in G5 & ERL. Work continues on supporting the large number of cameras from a single Linux machine. Assembly of electronics for processing signals from the Faraday cups continues.

**FPC conditioning:** Finished conditioning in the pulsed mode up to 2 ms at 100 Hz, reached 250 kW at different reflection phases, completed 125kW CW mode.

**Photocathode**: Looking into vacuum leak in main chamber. Ask for support from C-AD vacuum group.

**Laser:** During locking stability testing this week, a problem developed with the laser control. A stepper motor inside the laser is used to adjust the length of the cavity (and thus its repetition rate). The control of this stepper started behaving erratically, ultimately stranding the laser at the short extreme of its cavity length and losing the alignment. From the details of the behavior it seems most likely a controller fault, and we are following up with the laser company for a solution. We were able to recover the alignment at the new position so that other laser work can continue while we work on a solution to the new problem. Transport line work continues. A condensate pump has been ordered for the secondary air conditioning

system; it will function adequately using a temporary fix until the pump can be installed.

**Large Grain Gun:** Modified top plate expected to return. Stands are machined and assembled. Cavity processing has been completed and the cavity has been backfilled with nitrogen and leak-checked. In addition, the cavity will be crated and returned via FedEx overnight shipment. Arrival is expected next week.