

# Gun lab work progress

Participants: J. Clendenin, T. Galetto, T. Maruyama,  
and F. Zhou

# What have we done so far?

- Brought gun back stably operated at 120 kV.
- Replaced old cathode with new SLC cathode
  - Opened gun gas vessel (clam shelf) and installed the load lock system.
  - Old cathode retracted to emitter tube, and disassembled the puck tray.
  - SLC cathode preparation at CTS, and transported it to gun lab using puck tray.
  - Baked out puck tray
  - Stored old cathode in puck tray and put the new cathode at emitter tube/preparation chamber.

# What have we done (con't)?

- Heat cleaning, cool down
- Start cesiation in preparation chamber: to measure photoelectron generated by a diode laser; add NF<sub>3</sub>.
- 1<sup>st</sup> activation: 15  $\mu$ A of photoelectron (electrometer).
- 2<sup>nd</sup> activation: 15-20  $\mu$ A
- Insert the cathode into the gun
- Measure new SLC cathode QE using the diode laser on the optics bench.
  - Operated gun at low voltage 5 kV
  - Laser spot size at the cathode is ~5-6mm;
  - scan QE vs laser position at cathode (2 cm)
  - QE is reasonably uniform at least ~1.5x1.5cm area; maximum Nanometer current is 13  $\mu$ A.

# Summary

- Gun lab work progresses well
  - Brought gun back to stably operate at 120 kV
  - Replaced old cathode with new SLC cathode.
  - Generated photoelectrons using diode laser; max 13  $\mu\text{A}$ . QE is reasonably uniform at 1.5x1.5 cm on the cathode (2cm diameter)
- I am very happy to get through each step so far (still lots of steps ahead). Thank Tom, Takashi and Jym for the great helps.