

## **Electron Beam Dump Issues for Bremsstrahlung Photon Beam**

**An e- dump line was used in the BSY previously, but has been out of service for more than 20 years. The existing hardware is not connected.**

### **New beam trajectory needed:**

- 50 GeV beam will require stronger magnets and/or smaller deflection angle (6 to 8 degrees, rather than 12 degrees).
- Need to find optimum trajectory to minimize interference with other existing hardware.
- Avoid a trajectory that floods ESA with muons.

## **Dipole magnets to deflect spent e- beam to dump.**

- Four existing dump magnets in the BSY can be refurbished and upgraded. Several options have been studied previously by D. Walz.
- Magnets will require additional coils, to be wound at SLAC.
- LCW connections are available for dump magnets, but total cooling tower capacity may be a limitation during hot weather.
- Safety considerations may require a fail-safe method for preventing the primary e- beam from entering ESA. Options:
  - A permanent magnet in the beam line.
  - One or more dump magnets powered in series with main A-Bend magnets.

**Dump magnets will require a large power supply (approx 1 MW).**

- The power supply used for the SLC arcs is fully functional. It consists of four transformer/rectifier sets which can be reconfigured to provide a better voltage/current match to the magnets.
- A long DC cable run will be required. A preliminary look at options has been done, but no credible cost estimate has been prepared. BSY access is needed to study design options.

# Progress

- Three engineers and a mechanical designer have inspected the existing hardware in the BSY.
- Martin Berndt, retired power supply engineer, has been looking at power supply issues on a consulting basis.

# Plan

- The four existing dipoles will be removed from the BSY at the first convenient opportunity following E-158.
- The beam line vacuum chambers will be capped off temporarily.
- Sometime before the next E-158 run, a temporary vacuum chamber will be fabricated and installed in the gap left by the dump magnets.
- The dump magnets will be refurbished in the shops and eventually be re-installed in the BSY.

# Open Issues

- Engineering and designer resources are currently overbooked.
- No access allowed to the BSY during beam operations.