Irradiation Plan for 2009

- VCSEL/PIN irradiation in pre-qualification:
  - ~2 devices/vendor
  - process will continue for any newly available device
  - PIN received ½ SLHC dose in Aug. 2008
    - ⇨ re-qualify Optowell (GaAs) and Hamamatsu (Si)?
- VCSEL/PIN irradiation with large sample
  - ~20 devices/vendor
  - VCSEL: AOC 10 Gb/s, ~~AOC 5 Gb/s~~, ~~Optowell (2.5 Gb/s)~~
  - GaAs PIN: try to order 12-channel Hamamatsu bare dice
- Irradiation facility: 24 GeV protons at CERN in Aug. 2009
  - irradiate 2 devices from selected vendors at end of 2009 or early 2010 with π's @ PSI for NIEL hypothesis testing?

Irradiation Test System

- Temperature will be measured but not controlled
- VCSEL:
  - will monitor LIV curve for 2 devices/vendor
    - remaining 18 devices will be powered
    - will monitor LIV if feasible
  - will irradiate for ~8 hours/day and then anneal
- PIN:
  - mode scrambler will be installed for two arrays
    - will monitor PIN currents of these two arrays
    - remaining 18 devices will be powered
      - will illuminate the devices if feasible
  - cannot move the devices during irradiation

Control Sample of PIN

- Hamamatsu S5973?
  - single-channel Si 850 nm device
  - bandwidth: 1 Gb/s
  - loss ~40% of responsivity at 1.5 x 10^{15} 1-MeV n_{eq}/cm^2
  - metallic package highly radioactive after irradiation
- Hamamatsu G8921?
  - 4-12 channel GaAs 850 nm array
  - bandwidth: 2.5 Gb/s
  - loss ~60% of responsivity at 8.2 x 10^{15} 1-MeV n_{eq}/cm^2
  - pre-mounted on ceramic
    - need custom alignment

Control Sample of VCSEL

- AOC 10 Gb/s?
  - 12 channel GaAs 850 nm array
  - bandwidth: 10 Gb/s
  - expensive: ~$300, including packaging