Electron Losses and Fields Investigation

Mission Critical Design Review
Facilities

Cian Costello

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Facilities: Fabrication

- Prototyping lab has:
  - Haas CNC
  - Manual mill and lathe
- Outside shops used:
  - Bellfx
- Anodizing done in-house, anodizing by Barry Avenue Plating Company
- Most of the current EPD was fabricated in-house
- PCBs are fabricated by Advanced Circuits and populated in-house
In-house thermal vacuum chamber:

- Pressure < 1 μTorr within 1 hour; < 0.05 μTorr has been demonstrated after a 96 hour bake-out
- Temperature range:
  - currently: -40°C to +85°C
  - future: -120°C to +85°C
- Cold plate for instrument testing needs to be upgraded for thermal balance tests
- Mu-metal room
  - Made of high permeability magnetic material
  - Majority of Earth’s magnetic field wraps around it
  - Can achieve less than 200 nanoteslas
- Helmholtz cage within chamber
  - Apply test signals or improve cancellations
  - Simulate spinning
- Overnight stability tests
Facilities: Vibration Testing

- Wallops Flight Facility for random vibration, and sine sweep diagnostics.
  - Vibe 1 (EE-109)
    - 12 data channels
    - 18 \( G_{\text{rms}} \)
    - Smaller shake table
  - Vibe 2 (NS-ROC)
    - 18 data channels
    - 22.4 \( G_{\text{rms}} \)
    - Large shake table
- Delta II confirmed as launch vehicle, shock testing planned
Facilities: Contamination Control

- In-house class 1000 flow bench (ISO class 6)
- In-house nitrogen purged lockers with moisture and oxidation control.
Testing of boards and some assembly done in EE Lab

Workspace for all ELFIN members

Fully equipped with DMMs, oscilloscopes, function generators, power supplies, and a vacuum oven