



VXD EMI

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# Summary of the Discussion

- Two aspects to consider
  - Beam-related EMI
  - Interference/noise from other detector subsystems

# Beam-Related EMI

- Beam-induced EMI can result from imperfections and leakage from beampipe if
  - BPM cables or vacuum pump ports are improperly shielded
    - if there is EMI leakage, the EMI can propagate along the beamline – can it be damped?
  - Grounding beamline, shielding at entrance to IR Hall?
  - Pulsed power sources near IR: crab cavities, RF kickers (modulators and effects on grounds) are possible sources of EMI and noise on grounds.
- What tests can be done without beam?
- Desire to commission ILC IR before detector in place to characterize EMI present

# Beam-related EMI

- Initial plan for beam test at SLAC's ESA or FFTB
  - Characterizing EMI power spectrum along beamline at various features (BPMs, profile monitors, gaps etc.).
    - Measure power spectrum at different locations and sensitivity to bunch charge, bunch length, ...
    - Accelerator expectations on EMI from beam
      - No sensitivity to bunch length.
  - Bristol+SLAC people looking into necessary instrumentation
  - Will need to submit a SLAC testbeam request in the next few weeks

# Potential Future Beamtests

- Test of SLD's VXD3
  - Review plans after initial set of antenna measurements
- R20 module tests
  - Try to understand what features might have caused failure seen with SLD
  - Front end board electronics:
    - Lock signal of phase lock loop
    - Scope diagnostics for signals
    - Look at ccd clock lines

# Noise from Detector Subsystems

- Sensitivity of sensors and electronics.
  - Spec an EMI power spectrum tolerance?
- Work to develop general EMI standards for both detector subsystem electronics and for accelerator.
  - Relevant experience from CMS, (ATLAS)
  - Put together test kit to characterise sensitivity of detector electronic systems/power supplies

# References

## ● References on EMI available at:

- <http://www.slac.stanford.edu/xorg/lcd/ipbi/monthlymeetings/04may2005/agenda.html>



# Summary

- Plan for parasitic work at FFTB/ESA
  - Power spectrum
  - RF sources
- Investigate SLD R20+VXD3 based on experience
- Develop EMI standards for detector and accelerator components