SiD Homework for Paris
(mostly tracking)

SiD Meeting
January 22, 2004
John Jaros
Continue, Complete Basics

- **Tracking Pattern Recognition Studies (S. Wagner)**
  - Pattern recognition for q qbar events
  - Ditto, with noise from pairs and photons
  - Ditto, with 2 photon backgrounds too

- **Tracking Occupancy Studies (T. Maruyama, T. Abe)**
  - Occupancy Fwd and Barrel trackers due to pairs, photons, and gamma-gamma
  - Occupancy VXD due pairs, photons, gamma-gamma.
  - Do we need timing? More segmentation?
Full Detector Simulation

• Include photon interactions with realistic detector materials
• Include full backgrounds-- pairs, gammas and 2 photon events.
• Include detector response, noise, digitization, and hit reconstruction
Define Forward Tracking

• Refine forward VXD design
  New beam pipe design (with Markiewicz)
  Performance of CCD disk endplates
  Occupancies OK? Readout OK?
  Pattern recognition studies?

• Define forward disks baseline
  Performance evaluated
  Occupancies, timing, pat rec
Answer Lingering SiD Questions

- **Response to long-lived exotics**
  Full sim event pictures

- **Response to $K^0$’s and $\Lambda$’s**
  Full sim event pictures (pat rec in SiW Cal?)
  How much does Jet Resolution degrade if measure $K$’s and $\Lambda$’s calorimetrically?

- **Do thin tracker endcaps really help?**
  Endcap Cal Resolution vs tracker thickness
Backgrounds

- What do 2 photon and pair backgrounds do to the forward calorimetry?
  - Occupancy and issue?
  - Timing requirements?

- Is the 2 photon cross section right?

- What are the real machine backgrounds? How to characterize Large Ionization Loss Fliers?
Bolster the SiD Case

- What physics do we buy with the super momentum resolution?

- SiD should have better track-pair resolution than a TPC. Can we demonstrate it?

- Is SiD easier to calibrate than a TPC?

- What else?
Help from our Friends

• How thin can a robust mechanical support for the tracker be?
  SciDet at Fermilab?

• How to distribute power and readout?
  SciDet at Fermilab?

• What does the tracker look like?

• Feasibility of 5T Coil?