
Production Aspects of Sim/Recon for the LOI

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SiD Meeting, SLAC
March 2, 2009

Sim & Reco Summary

- The detector design, simulation and reconstruction versions were frozen for the LOI at Boulder.
 - sid02, slic v2r5p3, org.lcsim v1.4
- Many millions of single particle and diagnostic physics signals were generated and made available.
- Over 30 million benchmark physics events generated, simulated and passed through the reconstruction.
- Primarily done on dedicated batch system at SLAC and some at FNAL.

Benchmarking Sim & Reco Summary*

Process	Gen	Sim	Reco
500_SM	7.2 M	✓	✓
500_top	2.2 M	✓	✓
500_tau	3.2 M	✓	✓
500_SUSY	-**	✗	✗
500_bckgrnd	~700 k	✓	✓
500_pairs	1500	✗***	✗
250_SM	7.9 M	✓	✓
250_higgs	~250 k	✓	✓

* Have not completed QA for all events/files to account for crashes, etc.

** Most whizard events have been generated, awaiting mixing.

*** Will use different field map to accurately track far-forward particles.

Post-LCWS processing

- Recognized that lepton-ID had been missed, necessitating a further round of reconstruction.
 - Fairly easy to do, very quick.
- Generated large numbers of additional events to either expand the statistics of existing samples or to cover new processes.
- Tau samples had to be reprocessed to add missing decay times.

Analysis Reconstruction

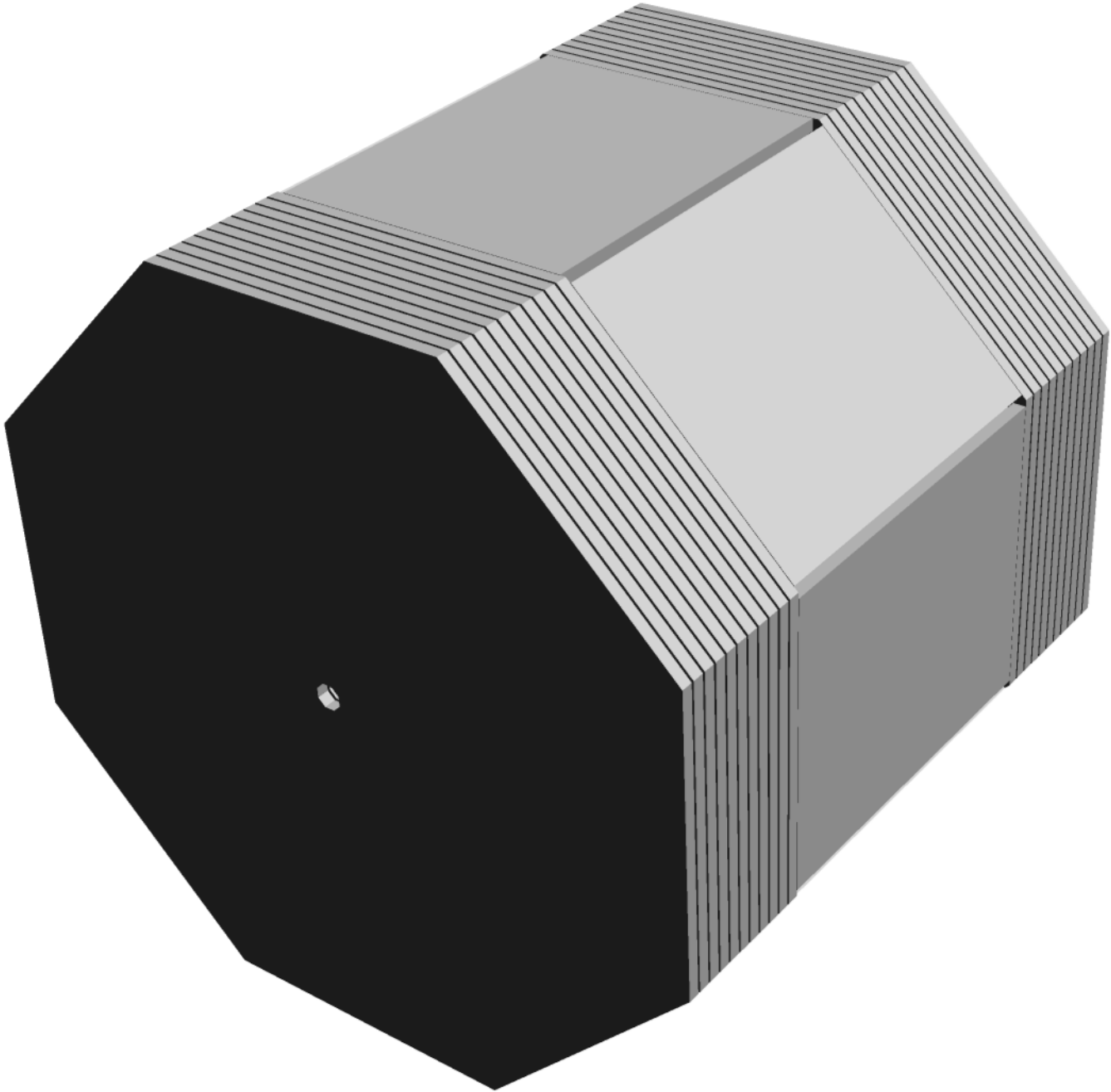
- The tasks of jet-finding, flavor-tagging and additional processing were delegated to the analysis groups.
- Loss of resources at SLAC in December meant a transition from ~100% efficiency in a batch environment to more complicated GRID environment.
 - See next talk by Marcel Stanitzki for details.

Beyond sid02

- The detector model sid02 was a necessary compromise between the desire to include all the details of the engineering designs and the need to complete the large-scale physics benchmarking simulations in a timely fashion.
- Since then have begun to work on a detector model which includes more realistic detectors.
 - Benefits from engineering work done for the LOI.
 - Allows much more realistic subdetector performance studies to be undertaken.

sidloi

- This model attempts to incorporate the detector as described in the LOI in as much detail as possible.
- Still a work in progress, as many of the details remain to be documented. (Hope to settle the outstanding issues here this week.)



Reconstruction

- Much of the reconstruction software will have to be modified or rewritten to accommodate the new geometries.
- New neighboring definitions and clustering code for the calorimeter.
- New tracking code for finding and fitting.
- New extrapolation and track-cluster association code.
- Loss of key individuals and lack of infrastructure support at the labs makes this very challenging.

Summary

- With a lot of hard work by a very small number of individuals we were able to simulate the detector response of SiD to the benchmark physics processes and to then reconstruct the events to provide input to the analysis groups.
- Work is ongoing to move beyond the strict scope of the LOI to improve both the detector model and the reconstruction code.
- Much work remains to be done for the TDR.
- Volunteers welcomed.