
Silicon Detector: Simulation & Reconstruction

Norman Graf
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250 GeV SM Sample post-LOI

- The correct luminosity files have been generated using guineapig, including the corrected (asymmetric) electron and positron beam energy spreads.
- eeh and $\mu\mu h$ signal samples for the higgs recoil analysis have been generated and made available to the concepts.
- Physics background samples have also been generated.
 - Expect the concepts to handle backgrounds differently (e.g. some may reweight existing samples instead of rerunning new events).

250 GeV cms, post_LOI Signal

- $e^+e^- \rightarrow Zh \rightarrow e^+e^- h$
- $e^+e^- \rightarrow Zh \rightarrow \mu^+\mu^- h$

- $m_h = 119.25, 119.7, 120.0, 120.3, 120.75$ GeV
- 1,000,000 events per energy per lepton flavor
- **10 million events**

- Plus some samples were regenerated with full SM decays, and some weight-one samples were also generated.

250 GeV cms, post_LOI Backgrounds

- $e^+e^- \rightarrow ZZ^*$: SLAC, LCG
stdhep: 8463
reco slcio: 8044
- $e^+e^- \rightarrow WW$: FNAL
stdhep: 12277
reco slcio: 12213
- $e^+e^- \rightarrow e^+e^-$ SLAC
stdhep: 6056
reco slcio: 5881
- $e^+e^- \rightarrow \mu^+\mu^-$ SLAC
stdhep: 6000
reco slcio: 5970

250 GeV cms, post_LOI Backgrounds

- e1n1n3: SLAC
stdhep: 2084
reco slcio: 1073
- e2n2n3: SLAC
stdhep: 1992
reco slcio: 1990
- lle3e3: SLAC
stdhep: 6602
reco slcio: 3964

250 GeV cms, post_LOI Backgrounds

- $e\gamma \rightarrow eee$ 1M SLAC, FNAL
stdhep: 10698
reco slcio: 8953
- $\gamma\gamma \rightarrow \text{hadrons}$ 216,965 202190.9 pb
- $\gamma\gamma \rightarrow \mu^+\mu^-$ 433,931 765060.9 pb
- Beam-Beam backgrounds (e^+e^- pairs)
 - Reused the events generated at 500GeV.

500 GeV cms

- Processed by Jan Strube @ RAL, DESY & IN2P3
- ttbar
 - One additional mass point at 174.5 GeV.
 - 1.1M events
- SUSY point 5
 - Three additional mass points to populate the ΔM_{ch1} , ΔM_{neu1} , ΔM_{neu2} phase space.
 - ~3.7 M events

Processing Strategy

- Successfully completing this exercise required the use of all available resources.
- The 500 GeV events were processed using the LCG (primarily RAL Tier 1, DESY, some IN2P3) by Jan Strube
 - Analysis groups are at Oxford.
- The 250GeV sample was processed at SLAC, on the FermiGrid (Jeremy McCormick), & opportunistically on the OSG, (with some processed by Jan on the LCG).
 - Analysis groups primarily at SLAC.