

Trilepton production at the CERN LHC: SUSY Signals and Standard Model Backgrounds

Thursday, July 16, 2009 11:55 AM (15 minutes)

Events with three or more isolated leptons in the final state are known to be signatures of new physics phenomena at high energy collider physics facilities. Standard model sources of isolated trilepton final states include gauge boson pair production such as WZ and $W\gamma^*$, and $t\bar{t}$ production. We demonstrate that leptons from heavy flavor decays, such as $b \rightarrow lX$ and $c \rightarrow lX$, provide sources of trileptons that can be orders-of-magnitude larger after cuts than other standard model backgrounds to new physics processes. We explain the physical reason heavy flavor backgrounds survive isolation cuts. We propose new cuts to control the backgrounds in the specific case of chargino plus neutralino pair production in supersymmetric models. After these cuts are imposed, we show that it should be possible to find at least a 4 sigma excess for supersymmetry parameter space point LM9 with 30 fb^{-1} of integrated luminosity.

This presentation is based on Phys. Rev. D **78**, 034030 (2008) [e-Print: arXiv:0805.3720 [hep-ph]] by E.L. Berger and Z. Sullivan and subsequent work.

Primary author: Dr BERGER, Edmond (Argonne National Laboratory)

Presenter: Dr BERGER, Edmond (Argonne National Laboratory)

Session Classification: III. Higgs and New Physics

Track Classification: Higgs and New Physics