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**Simulation of Top Quark Pair Production as a Background for Higgs Events at the Compact Muon Solenoid** CHRISTOPHER JUSTUS, JAMES DOLEN, REGINA DEMINA, University of Rochester, CMS COLLABORATION — In this study, we simulated top-antitop ( $t\bar{t}$ ) quark events at the Compact Muon Solenoid (CMS), an experiment presently being constructed at the Large Hadron Collider in Geneva, Switzerland. The  $t\bar{t}$  process is an important background for Higgs events. We used a chain of software to simulate and reconstruct processes that will occur inside the detector. CMKIN was used to generate and store Monte Carlo Events. OSCAR, a GEANT4 based CMS detector simulator, was used to simulate the CMS detector and how particles would interact with the detector. Next, we used ORCA to simulate the response of the readout electronics at CMS. Last, we used the Jet/MET Root maker to create root files of jets and missing energy. We are now using this software analysis chain to complete a systematic study of initial state radiation at hadron colliders. This study is essential because  $t\bar{t}$  is the main background for the Higgs boson and these processes are extremely sensitive to initial state radiation. Results of our initial state radiation study will be presented. We started this study at the new LHC Physics Center (LPC) located at Fermi National Accelerator Laboratory, and we are now completing the study at the University of Rochester.

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