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**Background studies and spin correlation expectations in  $t\bar{t}$  events in the  $e\mu$  decay channel at the LHC** ALAETTIN SERHAN METE, Iowa State University, ATLAS COLLABORATION — One of the many interesting features of the top quark is its extraordinarily short lifetime. One consequence of this short lifetime is that the spin information of a decaying top quark is inherited by the decay products. Thus the spin information of the decaying top-antitop pairs can be extracted by examining the final state particles. A requisite step in such an analysis is the selection of a clean sample of  $t\bar{t} \rightarrow e\mu$  events and this can be done by a careful examination of the background processes. We lay out a cut based method to enhance the signal versus the background in  $t\bar{t}$  events in the  $e\mu$  decay channel using Monte Carlo events and we also map out a method to investigate  $t\bar{t}$  spin correlation at the ATLAS experiment at the LHC.

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