

MEASUREMENT OF THE $WZ \rightarrow 3l(e, \mu)$ CROSS-SECTION AT THE LHC

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The startup of the Large Hadron Collider (LHC) will allow to probe energy scales that existed picoseconds after the Big Bang. This will enable physicists to either confirm or refuse the Standard Model (SM) of Physics by finding, for example, the SM Higgs boson. If the Higgs is not found, the Standard Model will need to be refined, or completely revamped to accommodate New Physics. The measurement of the cross-section of the $WZ \rightarrow 3l(e, \mu)$ is one of the first SM candles to be used with the early data in order to trust our knowledge of the known processes.

Monte Carlo samples of main SM processes were produced to simulate the conditions in the Compact Muon Solenoid (CMS) detector. The W and Z vector bosons were detected via their decay products with either electrons or muons in the final state. Data methods were developed to extract lepton efficiencies and fake identification rates from samples that will be collected at the start of LHC operations. Algorithms were used to maximize the performance of the analysis in order to have the highest efficiency and the lowest background possible.

The cross-section of the WZ channel and the statistical precision with 1fb^{-1} is calculated. Results look promising and we are expecting to have a 5σ observation of this process with less than 1fb^{-1} of data.

C. Melachrinos was supported by MIT UROP funding.