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ATLAS Monte Carlo studies for the search of heavy resonances in the $H \rightarrow ZZ \rightarrow 4l$ decay channel.

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The search of a heavy resonance denoted H , decaying into four-leptonic final states through a pair of Z bosons is discussed. This study mainly focuses on the high mass region of the $H \rightarrow ZZ \rightarrow 4l$ decay channel with the ATLAS detector. Two different sets of signal Monte Carlo (MC) samples produced with different pileup conditions were studied for the gluon-gluon fusion production mode. For the MC comparisons, signal efficiency studies are presented at selected mass points. Also, shape comparisons of selected mass and kinematic (H , Z , leptons) variables were performed at the same time.

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