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Systematic uncertainties in the search for a high mass scalar decaying to 4 leptons in the ATLAS detector at the LHC

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Searches for heavy scalars beyond the Standard Model are ongoing endeavours at the LHC. One particularly interesting method of doing this is through the hypothetical decay of the heavy scalar to two Z bosons, which subsequently decay to four leptons. In this work, the ATLAS high mass four lepton search is discussed with emphasis on its experimental systematic uncertainties. The background statistical framework is explained and applied to the Run 2 ATLAS data. Prospects and implications are discussed in the context of searches for new heavy bosons at the LHC.

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