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Search for new spin-1 or spin-0 boson using ATLAS detector data

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We present a search for a new spin-1 or spin-0 boson where the Standard Model Higgs boson decays into a four lepton final state ($\ell = \mu$ or e) corresponding to the $H \rightarrow XX \rightarrow 4\ell$. In this scenario, X is the new boson found in the intermediate state, having a mass range of between 15 - 60 GeV. The search is conducted using pp collision data collected with the ATLAS detector at the LHC, where the total integrated luminosity corresponds to 139 fb^{-1} at a centre of mass energy of $\sqrt{s} = 13 \text{ TeV}$. No significant deviation from the Standard Model was observed in the data. However, an improvement of a factor between 2 and 4 from the previous iteration of the analysis was observed for the limits that were set on the fiducial cross-section and the branching ratio of the Higgs boson. Limits were also set on the mixing parameter related to the Beyond Standard Model framework used in this analysis.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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