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## Search for BSM di-Higgs with final state of $\gamma\gamma$ and the semileptonic decays of $WW$ via ATLAS detector

Searches for resonant and non-resonant Higgs boson pair production are performed in the final state of  $\gamma\gamma WW^*(\rightarrow l\nu jj)$  using  $13.3\text{fb}^{-1}$  of proton-proton collision data recorded at  $\sqrt{s} = 13$  TeV by the ATLAS detector at the Large Hadron Collider. No significant deviation from the Standard Model prediction is observed in data. A 95% confidence-level observed upper limit of 25.0 pb is set on the cross section for non-resonant production, while the expected limit is 12.9pb. With the same set of data, a narrow-width  $X \rightarrow hh$  resonance is searched for and the corresponding observed (expected) upper limits range between 47.7 pb (24.3 pb) and 24.7 pb (12.7 pb) for masses of the resonance between 260 and 500 GeV.

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