

Search for non-resonant di-Higgs production in the $HH \rightarrow b\bar{b}\gamma\gamma$ decay channel in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector

Monday, 12 July 2021 16:30 (15 minutes)

We present a search for non-resonant di-Higgs production in the $HH \rightarrow b\bar{b}\gamma\gamma$ decay channel. The measurement uses 139 fb^{-1} of pp collisions recorded by the ATLAS experiment at a center-of-mass energy of 13 TeV. Selected events are separated into multiple regions, targeting both the Standard Model (SM) signal and Beyond Standard Model (BSM) signals with modified Higgs self-couplings. Further details on the optimization of the event selection are highlighted. No excess with respect to background expectations are found and upper limits at 95% confidence level are set on the di-Higgs production cross sections. The observed (expected) limit on the Standard Model cross section is 130 fb (180 fb), corresponding to 4.1 (5.5) times the predicted value. The observed (expected) Higgs trilinear coupling modifier is constrained to be between [-1.5, 6.7] ([2.4, 7.7]).

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Session Classification: Higgs & Electroweak Physics

Track Classification: Higgs & Electroweak Physics