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Prospects for measurements of the HZZ vertex tensor structure in $H \rightarrow ZZ_* \rightarrow 4I$ decay channel with ATLAS

In this note, the prospects for experimental studies of the general HVV tensor coupling using the H \rightarrow ZZ* \rightarrow 4l decay are presented. The sensitivity of the ATLAS experi- ment to non-Standard Model contributions to the HZZ vertex is estimated for 300 fb–1 and 3000 fb–1 of LHC data at \sqrt{s} = 14 TeV. The exclusion limits on the non-Standard Model CP-even coupling g2 and CP-odd coupling g4, given the Standard Model Higgs boson sig- nal, are estimated. The sensitivity of the ATLAS experiment to the complex structure of the non-Standard Model couplings is demonstrated. The exclusion limits are established for individual components of g2 and g4: |g2|/g1, |g4|/g1, R(g2)/g1, I(g2)/g1, R(g4)/g1 and I(g4)/g1 . The obtained results are translated to the (fg2 , fg4 , φ g2 , φ g4) parametrisation as

fg2 < 0.29 (0.12) at 95% CL and fg4 < 0.15 (0.037) at 95% CL for 300 fb-1 (3000 fb-1) respectively.

Primary author: ATLAS, Collaboration (_)

Presenter: ATLAS, Collaboration (_)