

Cross section measurement of the Higgs boson decaying in tau-lepton pair with the ATLAS detector

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A measurement of the production cross sections of the Higgs boson in proton–proton collisions is presented in the $H \rightarrow \tau\tau$ decay channel. The analysis is performed using Run 2 data recorded by the ATLAS experiment during the 2015 and 2016 period at the Large Hadron Collider at a center-of-mass energy of $\sqrt{s} = 13$ TeV. The $H \rightarrow \tau\tau$ signal over the expected background processes is established with an observed (expected) significance of 4.4 (4.1) standard deviations. Combining this measurement with the results from Run 1 analysis, the observed (expected) significance amounts to 6.4 (5.4) standard deviations, leading to an observation of Higgs boson decaying into tau-lepton pair. The total cross sections in the $H \rightarrow \tau\tau$ decay channel will be also presented separately for vector boson fusion production and gluon–gluon fusion production. Results are in agreement with Standard Model expectations.

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