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Observation of the Higgs boson decay to a pair of τ leptons with the CMS detector (Article) (Open Access)

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Abstract

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A measurement of the H→ τ τ signal strength is performed using events recorded in proton–proton collisions by the CMS experiment at the LHC in 2016 at a center-of-mass energy of 13TeV. The data set corresponds to an integrated luminosity of 35.9fb^{-1}. The H→ τ τ signal is established with a significance of 4.9 standard deviations, to be compared to an expected significance of 4.7 standard deviations. The best fit of the product of the observed H→ τ τ signal production cross section and branching fraction is $1.09_{-0.26}^{+0.27}$ times the standard model expectation. The combination with the corresponding measurement performed with data collected by the CMS experiment at center-of-mass energies of 7 and 8TeV leads to an observed significance of 5.9 standard deviations, equal to the expected significance. This is the first observation of Higgs boson decays to τ leptons by a single experiment. © 2018 The Author(s)

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