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Search for the associated production of the Higgs boson and a vector boson in proton - proton collisions at $\sqrt{s} = 13$ TeV via Higgs boson decays to τ leptons (Article) [Open Access](#)

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Abstract

A search for the standard model Higgs boson produced in association with a W or a Z boson and decaying to a pair of τ leptons is performed. A data sample of proton-proton collisions collected at $s = 13$ TeV by the CMS experiment at the CERN LHC is used, corresponding to an integrated luminosity of 35.9 fb^{-1} . The signal strength is measured relative to the expectation for the standard model Higgs boson, yielding $\mu = 2.5_{-1.3}^{+1.4}$. These results are combined with earlier CMS measurements targeting Higgs boson decays to a pair of τ leptons, performed with the same data set in the gluon fusion and vector boson fusion production modes. The combined signal strength is $\mu = 1.24_{-0.27}^{+0.29}$ ($1.00_{-0.23}^{+0.24}$ expected), and the observed significance is 5.5 standard deviations (4.8 expected) for a Higgs boson mass of 125 GeV.[Figure not available: see fulltext.] © 2019, The Author(s).

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