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Combined measurements of Higgs boson couplings in proton–proton collisions at $\sqrt{s}=13\text{TeV}$ (Article) [\(Open Access\)](#)

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Abstract

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Combined measurements of the production and decay rates of the Higgs boson, as well as its couplings to vector bosons and fermions, are presented. The analysis uses the LHC proton–proton collision data set recorded with the CMS detector in 2016 at $\sqrt{s}=13\text{TeV}$, corresponding to an integrated luminosity of 35.9fb^{-1} . The combination is based on analyses targeting the five main Higgs boson production mechanisms (gluon fusion, vector boson fusion, and associated production with a W or Z boson, or a top quark–antiquark pair) and the following decay modes: $H \rightarrow \gamma\gamma$, $Z Z$, $W W$, $\tau\tau$, $b b$, and $\mu\mu$. Searches for invisible Higgs boson decays are also considered. The best-fit ratio of the signal yield to the standard model expectation is measured to be $\mu = 1.17 \pm 0.10$, assuming a Higgs boson mass of 125.09GeV . Additional results are given for various assumptions on the scaling behavior of the production and decay modes, including generic parametrizations based on ratios of cross sections and branching fractions or couplings. The results are compatible with the standard model predictions in all parametrizations considered. In addition, constraints are placed on various two Higgs doublet models. © 2019, CERN for the benefit of the CMS collaboration.

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Topic: Collisions | Jets | Proton–proton collisions

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Funding text #2

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