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Evidence for H → μμ with CMS Run II Data and Projected Sensitivity at the HL-LHC

Evidence for Higgs boson decay to a pair of muons is presented, using proton-proton collision data at √s = 13 TeV, corresponding to an integrated luminosity of 137fb−1, recorded by the CMS experiment at the CERN LHC. This result
combines searches in four exclusive categories targeting the production of the Higgs boson via gluon fusion, via vector boson fusion, in association with a vector boson, and in association with a top quark-antiquark pair. An excess is observed with a significance of 3.0 standard deviations, where the expected significance is 2.5 for the Standard Model Higgs boson with a mass of 125.38 GeV. Extrapolations of the Run-2 H → μμ analyses from ATLAS and CMS to HL-LHC conditions predict a significant improvement in measurement precision.

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