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Evidence for Higgs decay to a pair of muons IRENE DUTTA, Caltech, CMS COLLABORATION — The CMS collaboration recently presented their results on the Higgs decay to a pair of muons with 137 fb^{-1} of data at $\sqrt{s} = 13$ TeV. The analysis targeted four different production modes, the gluon fusion (ggH), the vector boson fusion (VBF), the Higgs-strahlung process (VH) and the production in association with a pair of top quarks (ttH). Each of these categories had developed it's own dedicated boosted decision tree (BDT) or a deep neural-network (DNN) to efficiently separate the signal from the major background processes. The VBF category used a template-based fit to the DNN score whereas the remaining categories performed data-driven fits to the dimuon mass spectrum. A combined fit from all these categories sees a slight excess in the data corresponding to 3.0 standard deviations at $M_H = 125.38$ GeV (the most precise measurement of the Higgs boson mass to date). This is the first evidence for the Higgs Boson decay to second-generation fermions and is thus an exciting result.

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