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## Search for associated production of a Higgs boson and a single top quark in proton-proton collisions at $\sqrt{s} = 13$ TeV

*Tuesday 30 July 2019 17:00 (20 minutes)*

A search is presented for the production of a Higgs boson in association with a single top quark by the CMS experiment at the LHC at a center-of-mass energy of 13 TeV. The production cross section for this process is highly sensitive to the absolute values of the top quark Yukawa coupling, the Higgs boson coupling to vector bosons, and, uniquely, to their relative sign. Analyses using multilepton signatures, targeting  $H \rightarrow WW$ ,  $H \rightarrow \tau\tau$ , and  $H \rightarrow ZZ$  decay modes, and signatures with a single lepton and a  $bb$  pair, targeting the  $H \rightarrow bb$  decay, are combined with a reinterpretation of a measurement in the  $H \rightarrow \gamma\gamma$  channel to constrain the Yukawa coupling. Results from the 2016 dataset, corresponding to an integrated luminosity of  $35.9 \text{ fb}^{-1}$ , will be presented, along with prospects for future measurements.

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