Search for $t(\tau)\overline{t}\overline{t}H$ production in the all-jet final state in proton-proton collisions root s=13 TeV

By: Sirunyan, AM (Sirunyan, A. M.); Tumasyan, A. (Tumasyan, A.); Adam, W. (Adam, W.); Aaboud, G. (Aaboud, G.); Sirunyan, A; Tumasyan, A; Adam, W; Aaboud, G; Sirunyan, A; Tumasyan, A; Adam, W; Aaboud, G; Sirunyan, A; Tumasyan, A; Adam, W; Aaboud, G

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Abstract
An analysis is presented for the associated production of a Higgs boson with a top quark pair in the all-jet final state. Events containing seven or more jets are selected from a sample of proton-proton collisions at root s = 13 TeV collected with the CMS detector at the LHC in 2016, corresponding to an integrated luminosity of 35.9 fb(-1). To separate the t(\tau) overbar{t}\overline{t}H signal from the irreducible background, the analysis assigns leading order matrix element signal and background probability densities to each event. A likelihood-ratio statistic based on these probability densities is used to extract the signal. The results are provided in terms of an observed t(\tau) overbar{t}\overline{t}H signal strength relative to the standard model production cross section $\mu_H = \sigma_H/\sigma_{HSM}$, assuming a Higgs boson mass of 125 GeV. The best fit values are $(\mu_H)_{obs} = 0.9_{-0.7}^{+0.9}$/stat. $\pm 1.3_{syst} = 0.9_{-0.7}^{+0.9}$/total, and the observed and expected upper limits are, respectively, $\mu_H < 3.8$ and $< 3.1$ at 95% confidence levels.

Keywords
Hadr. scattering (experiments); Higgs physics; Top physics

Author Information
Reprint Address: Sirunyan, AM (reprint author)

Addresses:
[2] Inst Hochenergiephys, Vienna, Austria
[3] Inst Nucl Problems, Minsk, BELARUS
[4] Univ Antwerp, Antwerp, Belgium
[5] Vrije Univ Brussel, Brussels, Belgium
[6] Univ Libre Bruxelles, Brussels, Belgium
[7] Univ Gent, Gent, Belgium
[8] Catholic Univ Louvain, Louvain La Neuve, Belgium
[9] Ctr Brasileiro Pesquisas Fis, Rio De Janeiro, Brazil
[10] Univ Estado Rio De Janeiro, Rio De Janeiro, Brazil
[11] Univ Estadual Paulista, Sao Paulo, Brazil
[12] Univ Fed ABC, Sao Paulo, Brazil
[14] Univ Sofia, Sofia, Bulgaria

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