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Journal of High Energy Physics [Open Access](#)  
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## Measurement of the top quark pair production cross section in dilepton final states containing one $\tau$ lepton in pp collisions at $\sqrt{s} = 13$ TeV (Article) [\(Open Access\)](#)

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### Abstract

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The cross section of top quark pair production is measured in the  $t\bar{t} \rightarrow (\ell\nu\ell)(\tau\nu\tau)bb^-$  final state, where  $\tau_h$  refers to the hadronic decays of the  $\tau$  lepton, and  $\ell$  is either an electron or a muon. The data sample corresponds to an integrated luminosity of  $35.9 \text{ fb}^{-1}$  collected in proton-proton collisions at  $s = 13$  TeV with the CMS detector. The measured cross section is  $\sigma_{t\bar{t}} = 781 \pm 7$  (stat)  $\pm 62$  (syst)  $\pm 20$  (lumi) pb, and the ratio of the partial width  $\Gamma(t \rightarrow \tau\nu_b)$  to the total decay width of the top quark is measured to be  $0.1050 \pm 0.0009$  (stat)  $\pm 0.0071$  (syst). This is the first measurement of the  $t\bar{t}$  production cross section in proton-proton collisions at  $s = 13$  TeV that explicitly includes  $\tau$  leptons. The ratio of the cross sections in the  $\ell\tau_h$  and  $\ell\ell$  final states yields a value  $R_{\ell\tau_h/\ell\ell} = 0.973 \pm 0.009$  (stat)  $\pm 0.066$  (syst), consistent with lepton universality. [Figure not available: see fulltext.] © 2020, The Author(s).

### SciVal Topic Prominence [i](#)

Topic: Top Quark | Partons | Higgs Bosons

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| Horizon 2020 Framework Programme<br>See opportunities by H2020 <a href="#">↗</a> | 752730,765710  | H2020   |

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