Measurement of the single top quark and antiquark production cross sections in the t channel and their ratio in proton-proton collisions at root s=13 TeV

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Abstract

Measurements of the cross sections for the production of single top quarks and antiquarks in the t channel, and their ratio, are presented for proton-proton collisions at a center-of-mass energy of 13 TeV. The data set used was recorded in 2016 by the CMS detector at the LHC and corresponds to an integrated luminosity of 35.9 fb(-1). Events with one muon or electron are selected, and different categories of jet and b jet multiplicity and multivariate discriminators are applied to separate the signal from the background. The cross sections for the t-channel production of single top quarks and antiquarks are measured to be 130 +/- 1(stat) +/- 19(syst) pb and 77 +/- 1(stat) +/- 12(syst) pb, respectively, and their ratio is 1.68 +/- 0.02(stat) +/- 0.05(syst). The results are in agreement with the predictions from the standard model. (C) 2019 The Author(s). Published by Elsevier B.V.

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