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Abstract

A measurement is presented of differential cross sections for t-channel single top quark and antiquark production in proton-proton collisions at a centre-of-mass energy of 13 mml:mspace> by the CMS experiment at the LHC. From a data set corresponding to an integrated luminosity of 35.9 mml:mspacefb-1, events containing one muon or electron and two or three jets are analysed. The cross section is measured as a function of the top quark transverse momentum (pT), rapidity, and polarisation angle, the charged lepton pT and rapidity, and the pT of the W boson from the top quark decay. In addition, the charge ratio is measured differentially as a function of the top quark, charged lepton, and W boson kinematic observables. The results are found to be in agreement with standard model predictions using various next-to-leading-order event generators and sets of parton distribution functions. Additionally, the spin asymmetry, sensitive to the top quark polarisation, is determined from the differential distribution of the polarisation angle at parton level to be 0.440 +/- 0.070, in agreement with the standard model prediction.

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KeyWords Plus: PARTON DISTRIBUTIONS; LHC

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