

Abstract Submitted
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Search for four top quark production in the single-lepton final state with the CMS data WENYU ZHANG, EMANUELE USAI, SINAN SAGIR, MEENAKSHI NARAIN, ULRICH HEINTZ, Brown University, THE COMPACT MUON SOLENOID COLLABORATION — We present a search for the standard model four top quark (tttt) production in the single-lepton final state. We analyze the proton-proton collision data collected by the CMS experiment at center-of-mass energy of 13 TeV, corresponding to an integrated luminosity of 35.8 fb^{-1} in 2016, 41.5 fb^{-1} in 2017 and 59.97 fb^{-1} in 2018. The single lepton final state features a high jet multiplicity, with at least four jets coming from the hadronization of a bottom quark, an electron or a muon, and missing transverse momentum from neutrino. We consider the distribution of the scalar sum of transverse momentum of all the jets (HT) to discriminate the signal from background and, in the absence of signal, set limits on the four tops production cross section. The expected limits and significances on tttt production cross section for data-taking period 2016 to 2018, and their combination are presented. In addition, we perform a multivariate analysis using Boosted Decision Tree (BDT)-based approach to optimize the discrimination between signal and background. Comparison between the HT-based analysis and BDT-based analysis will be discussed.

Wenyu Zhang
Brown University

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