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Measurement of differential top-quark-pair production cross sections in the lepton+jets channel with CMS

Normalised differential top-quark-pair ($t\bar{t}$) production cross sections are measured in pp collisions at 7 and 8 TeV centre-of-mass energy with the CMS detector. Such distributions constitute a test of perturbative QCD at high energy scales and can help to constrain QCD parameters like parton distribution functions. Moreover, they can provide an improved description of $t\bar{t}$ background distributions for new physics searches and are sensitive to potential new physics effects themselves. The measurements are performed in the lepton+jets decay channels (e +jets and μ +jets) as a function of kinematic properties of the final-state charged leptons and b jets, as well as those of the top quarks and the $t\bar{t}$ system. The data are compared with several predictions from QCD calculations up to approximate next-to-next-to-leading-order precision. No significant deviations from the standard model are observed.

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