

Search for $t\bar{t}$ resonances in semileptonic final states in pp collisions at $\sqrt{s} = 8$ TeV

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We present a search for the production of heavy resonances decaying into top-antitop quark pairs at the CMS Experiment. The data correspond to an integrated luminosity of 19.6 fb^{-1} at $\sqrt{s} = 8$ TeV. We consider all events containing one muon or electron and at least two jets in the final state. We present results from the combination of two dedicated searches, the first optimized for $t\bar{t}$ production at the kinematic production threshold, and the other optimized for $t\bar{t}$ production produced with high Lorentz boosts. We do not observe any excess of events above the expected yield from the standard model processes. We set the following limits at 95% CL on the production of non-SM particles: top color Z' bosons with relative widths of 1.2% and 10% are excluded for masses below 2.1 TeV and 2.7 TeV. An upper limit of 1.94 pb and 0.029 pb is set on the production cross section times branching fraction for narrow resonances with masses of 0.5 TeV and 2 TeV. Likewise, limits of 1.71 pb and 0.045 pb are set for wide resonances with masses of 0.5 TeV and 2 TeV. In addition, Kaluza–Klein excitations of a gluon with masses below 2.5 TeV in the Randall–Sundrum model are excluded and an upper limit of 0.101 pb is set for a resonance mass of 2 TeV.

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