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Searches for $t\bar{t}$ resonances with the CMS detector at 13 TeV

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We present the most recent results on searches for new massive resonances decaying to a top-antitop quark pair with the CMS detector at the LHC.

Searches are performed by measuring the invariant mass distribution of the $t\bar{t}$ system, both in semileptonic and fully-hadronic final states, using the data collected by the CMS experiment in pp collisions at $\sqrt{s}=13$ TeV in 2015, the first year of the LHC Run-2.

In order to maximize the analysis sensitivity for BSM resonances with a mass above the TeV scale, dedicated techniques are used to identify the decay of highly-boosted top quarks: these methods include the identification of poorly isolated prompt leptons overlapping with a b-jet and the use of a top-tagging algorithm to reconstruct fully-merged jets with substructure properties.

No significant excess is observed in the data compared to the expected SM background and exclusion limits are set on the cross section of a $t\bar{t}$ resonance in different BSM scenarios. Finally, we discuss how these first results with 13 TeV data complement and possibly improve the exclusion limits for resonant $t\bar{t}$ production set in Run-1.

Summary

We present the most recent results on searches for new massive resonances decaying to a top-antitop quark pair with data collected by the CMS experiment at the LHC in Run-2.

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