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Limits on Torsion parameters from $t\bar{t}$ production at LHC

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Torsion models constitute a well known class of extended quantum gravity models. In this work, one investigates phenomenological consequences of a torsion field interacting in different ways with top quarks at LHC. A torsion field could appear as a new heavy state characterized by its mass and couplings to fermions. This new state would form a resonance decaying into a top anti-top pair. The latest ATLAS results with 13 TeV data are used to set limits on torsion parameters.

The integrated luminosity needed to observe torsion resonance at the next LHC upgrades are also evaluated, considering different values for the torsion mass and its couplings to Standard Model fermions. Finally, prospects for torsion exclusion at the future LHC phase II and phase III are obtained.

Experimental Collaboration

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