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Limits on Exotics Bosons at LHC

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I will present recent results on searching for two exotics signal at LHC: torsion and bileptons. Torsion models constitute a well known class of extended quantum gravity models. In this work, one investigates the phenomenological consequences of a torsion field interacting with top quarks at the 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 $t\bar{t}$ production results from LHC 13 TeV data are used to set limits on torsion parameters. Bileptons are bosons which have double electric charge and leptonic number. They are predicted in 331 models. We perform a study assuming different bilepton masses and calculate cross-section for different process mediated by bileptons. Combining these calculations with the latest ATLAS results at 8 TeV, we derive, for the first time, bounds on bilepton mass using LHC data. A detector simulation is also performed using the DELPHES package assuming a LHC center-of-mass energy of 13 TeV. The results of the simulation are used to obtain minimal integrated luminosities needed for discovering torsion and bileptons at LHC 13 TeV.

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