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Internal gauge structure and ghost instabilities in general torsion theories

We analyze which internal affine gauge transformations can be attributed to the torsion, focussing on those that tensor give rise to Lie algebras. We find two such non-trivial structures, in which the gauge parameters are a two form and a scalar. In the first case gauge invariant variables are singled out, and a higher derivative power-counting renormalizable invariant action is derived. The Lagrangian depends on four free parameters, and a stability analysis shows that it is free from ghost instabilities in Euclidean signature, though we find a tachyonic scalar mode.

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