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New classes of modified teleparallel gravity models

In this talk, a new class of modified teleparallel theory is presented. The action of this theory is constructed by a function of the irreducible parts of torsion $f(T_{ax}, T_{ten}, T_{vec})$, where T_{ax} , T_{ten} and T_{vec} are the axial, tensor and vector components of torsion. This is the most general (well-motivated) second order teleparallel theory of gravity that can be constructed from the torsion tensor. Different particular second order theories can be recovered from this theory as new general relativity, conformal teleparallel gravity or $f(T)$ gravity. Additionally, the boundary term B which connects the Ricci scalar with the torsion scalar via $R = -T + B$ is also incorporated in the action. By performing a conformal transformation, I will show that the unique theories which have an Einstein frame are either TEGR or $f(-T + B) = f(R)$ as expected. In this presentation, I will also discuss about the issue of the violation of the local Lorentz transformations within these theories.

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