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Viability of teleparallel theories of gravity

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General relativity has been very successful in describing gravity. However, cosmological observations such as the dark sector of the universe, the value of the cosmological constant, and the Hubble constant give indications to new physics. This might be explained by modified theories of gravity. What has often been overlooked is that general relativity has different equivalent descriptions. One of those is generally called teleparallel equivalent to general relativity, with an action formulation which only differs from the Einstein-Hilbert action by a boundary term. Starting from this action it is possible to formulate modified theories of gravity different from those based on the Einstein-Hilbert formulation. These theories are called teleparallel theories of gravity. I will present the present understanding of the viability of those theories based on the Hamiltonian analysis arxiv:2012.09180. I will also mention conclusions drawn from perturbation theory of teleparallel gravity in order to make stricter bounds on the viability.

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