Teleparallel bigravity

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Teleparallel gravity is a formulation of gravity with a connection with torsion and no curvature, in contrast to general relativity which exhibits a torsion-free connection with curvature (for an introduction see [1]). The covariant formulation of teleparallel gravity must include a spin connection, as a gauge field [2]. Remarkably, there is a formulation of teleparallel gravity which is equivalent to general relativity up to a boundary term. In addition the action has a Yang-Mills like structure and these two points make teleparallel gravity more reminiscent of the standard model of particle physics (SMPP). Bigravity is a theory of a massless and a massive spin-2 field (for a review of bimetric gravity see [3]). For all other spins in the SMPP we find massive particles. Teleparallel bigravity is hence taken even closer to SMPP. This is the first formulation of teleparallel bigravity to my knowledge. I will present the formulation and write out a generic class teleparallel gravity theories. Some basic insights of this new theory will be presented as well as the Hamiltonian formulation of the theory analogues to [4] (see also [5–7] for equivalent approaches). For the teleparallel formulation of bigravity it is important to use the tetrad/vierbein formulation as has been done for Hassan-Rosen bigravity in [8], where it is easy to show that all of the conclusions extends to the teleparallel equivalence of Hassan-Rosen bigravity.

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