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On the gauge fixing in the Hamiltonian in general teleparallel theories

To gauge fix, or not to gauge fix: that is the question I address in my talk. The covariant formulation of teleparallel gravity theories must be formulated with a spin connection. However, one can always choose a gauge which puts the spin connection to zero. This is not always preferred, though it definitely makes the Hamiltonian analysis easier. There are two ways to avoid gauge fixing. One way is to work in a more general Poincaré gauge theory where both curvature and torsion are present, and impose flatness buy Lagrange multipliers. This method is already quite involved and will be even more cumbersome when one consider more complicated teleparallel gravity theories. The second way is to do the Hamiltonian analysis with tetrad (or vierbein) fields and Lorentz matrices, and their velocities as canonical fields for the Hamiltonian analysis. In this talk I show, for general teleparallel gravity theories, that putting the spin connection to zero is indeed consistent with the Hamiltonian analysis in the covariant formulation, and can not change the count of degrees of freedom.
The contribution is based on an generalization of arXiv:1802.02130 [gr-qc] to appear in the proceedings of Teleparallel Universes in Salamanca (2018).

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