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The Proper Frame In Spherically Symmetric Teleparallel Geometries

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Modified frameworks of gravity are of growing interest in the field of cosmology, $f(T)$ -type gravity is one such framework, where instead of curvature, we use torsion as the fundamental source field for gravitational effects.

Expanding on former work, I present the local Lorentz transformation and the general proper frame for a class of spherically symmetric teleparallel geometries.

Starting with the diagonal frame and corresponding spin connection for a general spherically symmetric teleparallel geometry, a system of matrix partial differential equations is established using the transformation laws for the spin connection. Solving these equations yields a local Lorentz transformation which can be applied to the diagonal frame, bringing it to a purely inertial(proper) frame, where the spin connection vanishes and inertial effects are absent. The torsion and field equations are computed in the proper frame and compared to those found using the diagonal frame. Additionally, physically relevant sub-cases will be discussed.

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