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Teleparallel Gravity: Formalism and Predictions

Abstract

In the teleparallel formulation of gravity one uses a tetrad and a metric compatible spin-connection with torsion to describe the gravitational field instead of the metric and its torsion free metric compatible Levi-Civita connection. I will present the framework of covariant teleparallel gravity and how general relativity as well as modified theories of gravity can be formulated in this framework. Afterwards I focus on two most famous models, the so called new general relativity and f(T) theories, discuss their properties and present phenomenological predictions which can be compared to nowadays experimental data, such as gravitational waves and black hole shadows.