

Influence of the higher order derivatives on the planet perihelion precession in the Einstein field equations for vacuum condition

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Abstrak

ABSTRACT

This paper studies the effect of higher order derivative tensor in the Einstein field equations for vacuum condition on the planet perihelion precession. This tensor was initially proposed as the space-time curvature tensor by Deser and Tekin on discussions about the energy effects caused by this tensor. However, they include this tensor to Einstein field equations as a new model in general relativity theory. This is very interesting since there are some questions in cosmology and astrophysics that have no answers. Thus, they hoped this model could solve those problems by finding analytical or perturbative solution and interpreting it. In this case, the perturbative solution was used to find the Schwarzschild solution and it was also applied to consider the planetary motion in the solar gravitational field. Furthermore, it was proven that the tensor is divergence-free in order to keep the Einstein field equations remain valid.