



Iranian Journal of Physics Research, Vol. 21, No. 2, 2021
DOI: 10.47176/ijpr.21.2.21176

Noether symmetry in teleparalle extended gravity

A Rezaei Akbarieh, N Eghbali Ghazijhani, and S Kazempour

Faculty of Physics, University of Tabriz, Tabriz, Iran

E-mail: am.rezaei@tabrizu.ac.ir

(Received 21 December 2020 ; in final form 04 March 2021)

Abstract

In this paper, we study the $f(T, \tau)$ modified gravity theory, where T and τ represent the scalar-torsion and trace of energy-momentum tensor, respectively. According to our cosmological study, we show that the $f(T, \tau)$ gravity theory has a good agreement with observations. Function type for $f(T, \tau)$ can be determined by several factors. The most important motivation for determining $f(T, \tau)$ is that the Lagrangian of model follows the Noether continues symmetry; therefore, according to the Noether approach, we try to determine the function of $f(T, \tau)$. Moreover, the proposed model should behave in agreement with observations in terms of phenomenology. As a result, we compared the predictions of the model with observation constrains, for example, the cosmic microwave background and Hubble diagram can be mentioned. In this paper, we study the $f(T, \tau)$ gravity in the FRW space-time. So, we achieved the effective Lagrangian with respect to independent variables, scale factor a , scalar-torsion T and trace of energy-momentum tensor τ . After imposing the Noether symmetry to Lagrangian, we can introduce the suitable form for the function. . Then, we calculated the Noether conservative quantity for the model.

Keywords: cosmology, modified gravity, scalar-torsion, teleparallel gravity

For full article, refer to the Persian section