



Iranian Journal of Physics Research, Vol. 26, No. 1, 2026
DOI: 10.47176/ijpr.26.1.12052

Searching the TESS data for binary systems discovered by the Gaia spectroscopic observations

Aref Asadi* and Sedighe Sajadian

Department of Physics, Isfahan University of Technology, Isfahan, Iran

E-mail: aref.as121315@gmail.com

(Received 27 January 2025 ; in final form 03 October 2025)

Abstract

In this paper, we report the results of searching the TESS data from spectroscopic binary systems discovered by the Gaia telescope. The TESS telescope with a high photometric resolution generally observes bright and nearby stars with a cadence in the order of some minutes to half an hour. In this research, for 161 binary systems discovered through spectroscopic observations by the Gaia space telescope, we extract their photometric data taken by the TESS telescope to find any periodic either eclipse or self-lensing signal. Our aim was to determine the orbital inclination angle and other physical parameters of these systems if such signals are detected in their photometric data. We could not find such systems with photometric and periodic signals with the period exactly matching the orbital period reported by the Gaia telescope. Hence, none of systems are edge-on as seen by the observer. However, for some systems the periods of variations in their light curves are close to the orbital periods reported by the Gaia Telescope (differing by approximately 10 days or slightly more). In future, we aim to study their photometric data taken by other telescopes to resolve the nature of variations in their light curves.

Keywords: Spectroscopic binaries, Tess telescope, Gaia telescope

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