Eclipse-timing study of new hierarchical triple star candidates in the northern continuous viewing zone of *TESS*

Tibor Mitnyan[1,2], Tamás Borkovits[1,2,3,4,5], Donát R. Czavalinga[1,2], Saul A. Rappaport[6,2], András Pál[3], Brian P. Powell[7], Tamás Hajdu[3,8]

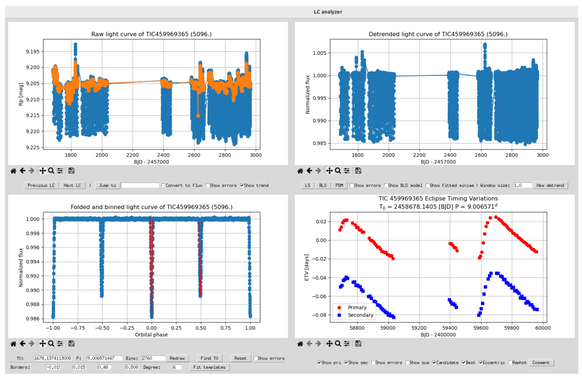
1 Baja Astronomical Observatory of University of Szeged, Szegedi út, Kt. 766, 6500 Baja, Hungary
2 HUN-REN-SZTE Stellar Astrophysics Research Group, Szegedi út, Kt. 766, 6500 Baja, Hungary
3 Konkoly Observatory, HUN-REN Research Centre for Astronomy and Earth Sciences, Konkoly Thege Miklós út 15-17, 1121 Budapest, Hungary
4 ELTE Gothard Astrophysical Observatory, Szent Imre h. u. 112, 9700 Szombathely, Hungary
5 HUN-REN-ELTE Exoplanet Research Group, Szent Imre h. u. 112, 9700 Szombathely, Hungary
6 Department of Physics, Kavli Institute for Astrophysics and Space Research, M.I.T., Cambridge, MA 02139, USA
7 NASA Goddard Space Flight Center, 8800 Greenbelt Road, Greenbelt, MD 20771, USA
8 Eszterházy Károly Catholic University, Department of Physics, Eszterházy tér 1, 3300 Eger, Hungary

BACKGROUND

Hierarchical triples are important objects because their exact **formation scenarios** and contributions to various **stellar evolutionary channels** are still debated. We need to **discover** and **analyze** more to answer these questions in the future.

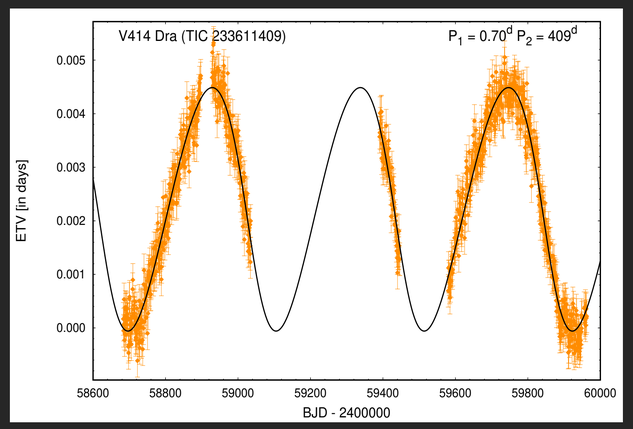
METHODS

1. Collected a sample of **~3500 eclipsing binaries**
2. Produced *TESS* **FFI light curves** up to sector 60 via FITSH (Pál 2012)
3. **Self-developed Python GUI** to calculate eclipse timing variations
4. **Analytical** LTTE and LTTE+dynamical **model fits** to the ETVs

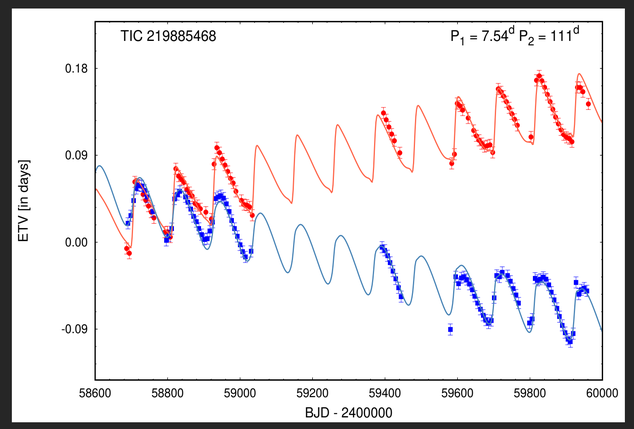


We **discovered** 125 new hierarchical triple candidates and **determined their outer orbital elements** based on nonlinear eclipse timing variations (ETVs).

Light travel-time effect (LTTE)



Dynamical perturbations



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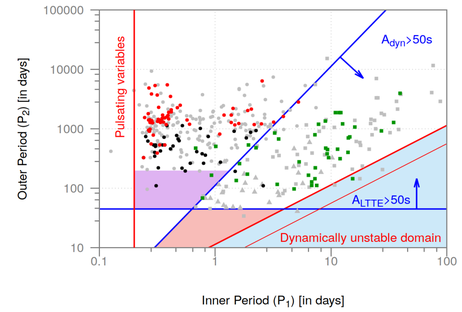
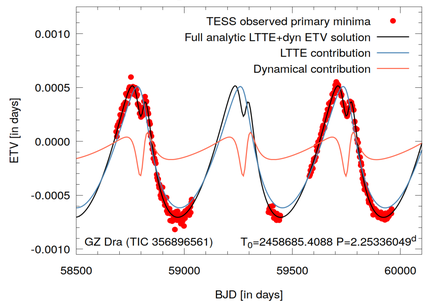
RESULTS

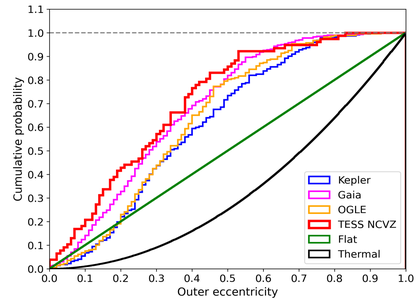
Outer orbital parameters for 94 LTTE and 41 LTTE+dynamical objects



GZ Dra is one of the most strongly inclined triple systems known



We compared orbital parameter distributions with data from the Kepler sample (Borkovits+2016)



We compared orbital parameters from our ETV solutions with those from the Gaia Non-Single Star catalog