The random transiter HD 139139

Jean Schneider LUTH - Paris Observatory jean.schneider@obspm.fr https://luth7.obspm.fr

The Random Transiter HD 139139 has presented erratic transits, one every 3 days in the mean, during the 87 days campaign C15 with the NASA Kepler observatory (Rappaport et al. 2016).

The authors tried ten explanations and found no one really convincing, leading Hugh Osborn (2019) to name it « the most mysterious star in the Galaxy »

New scenarii have been considered by Schneider 2019 (a, b).

Among them :

- one or some planet-moon systems around HD 139139

- a swarm of material on the line of sight. The latter can lie at three type of distances : circumstellar matter, intersideral matter, or Solar System matter.

In case of circumstellar or Solar System matter, the latter reflects the HD 139139 or Sun light.

To check these scenarios, I propose to search that reflected light around the line of sight of HD 139139. Since it is a priori fainter than HD 130139 itself, it is necessary to block the HD 139139 light.

I therefor propose to make coronagraphic imaging with the Roman Space Telescope :

- to distinguish the surroundings of HD 139139 and its fainter stellar neighbour at 3".

- to search for Solar System compact group of objects or ring-like structures around single objects

References

Osborn H., 2019 Why the "Random Transiter" is now the most mysterious star in the Galaxy http://www.hughosborn.co.uk/2019/06/29/why-the-random-transiter-is-the-most-mysterious-star-in-the-galaxy/

Rappaport S. et al. 2016 The Random Transiter EPIC/HD 139139 MNRAS

Schneider J. 2019 a What is Transiting HD 139139? RNAAS, 3, 141

Schneider J. 2019 b A Possible Scenario for the Random Transiter EPIC 249706694/ HD 139139 RNAAS, 3, 108