

Orbital variation of circumbinary planets

Abstract

Nowadays, more than 4,000 exoplanets have been discovered, including a hundred of circumbinary planets. In the following work, the orbital variations of circumbinary planets: planets orbit in the binary star systems, have been studied. Their orbital evolutions for a thousand years were simulated using the REBOUND package. The computed Hill's sphere and Roche limit of each system are applied to the published physical and orbital parameters of 88 planetary systems for an instability limit. The system can be classified into two categories: S-type and P-type, totaling 67 and 21 systems, respectively. This result shows that there are two unstable star systems: Kepler -420 and GJ 86. The instability might be caused by inaccurate measurement of the physical or orbital parameters of these two systems. Therefore, additional follow-up observations of the systems are needed.

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