

Constraints on circumbinary planet orbits from Kepler single transit events

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Abstract

All the known transiting circumbinary planets orbit very close to coplanar with their host binaries. But circumbinary systems are not, a priori, limited to this configuration; misaligned systems are likely to exist, and their discovery and characterisation of would shed light on the dynamical history of planets on circumbinary orbits, and on the possible migration mechanisms that might be acting on such complex systems.

We have identified candidate misaligned circumbinary systems within Kepler data. These candidates show single, non-periodic transits that can be used to place constraints on possible orbital configurations for the third body for given binary star parameters. We have developed tools to identify and model possible planetary orbits, and will present preliminary results for representative binary star cases that illustrate our ability to constrain the planet's orbital period and inclination.