Poster

Splinter Exoplanets

Photodynamical Modelling: An Update on Kepler-9

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A photodynamical model describes all transit lightcurves of a planetary system simultaneously under consideration of the system's dynamics. Calculating the lightcurves from the output of a numerical integration over the time span of observations leads to a better understanding and characterization of the system. Such a model is most suitable for systems that show variations in the transit time (TTVs). These variations as well as variations in transit depth and duration are directly modeled and explained by the gravitational interaction of all system's objects. Our model is coupled with a Markov chain Monte Carlo algorithm, that helps to explore the parameter space.

We present the application of our model to the Kepler-9 system including new ground-based observations of transit lightcurves from the years 2014 - 2017 obtained by the KOINet, a multi-site network of telescopes around the globe organized to follow-up KOIs with large TTVs.