

Detectability of Exomoons by Examining The Signals from a Model of Transiting Exoplanets with Moons Using TransitFit

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ABSTRACT

There are numerous moons orbiting planets in our solar system. This implies the existence of exomoons around exoplanets. The result in previous study shows unique features in Transit Timing Variations (TTV), Transit Duration Variations (TDV) and transit depth signals around the primary and secondary transits of exoplanet transiting models due to moon phase evolution. The aim of this work is examining the variation of TTV, TDV and transit depth signals and relate them to exomoon signals by using TransitFit to fit one-year synthetic star-planet-moon transit light curves. The result shows uncommon shape in fitted TTV, TDV and transit depth signals around moon phase of 0.25 and 0.75 which analogous to the primary and secondary transits. Hence, we can conclude that, by using TransitFit, the appearance of signal of exomoon in TTV, TDV and transit depth signals can be detected.

Keywords: exoplanet, exomoon, transit, TTV, TTD, transit depth, TransitFit