

Berardo, David

Analyzing Spitzer follow-up of K2 planets in preparation for the transition to TESS

The Spitzer space telescope has been and continues to be a useful tool for following up planets discovered by the K2 mission. Due to its higher cadence of observation, it can significantly improve orbital parameters and ephemerides of K2 planets, as well as provide further insights into the properties of their atmospheres through studying their infrared phase curves. In this work I use Spitzer observations in the 4.5 μm channel to analyze the HD106315 system, which is known to have at least two transiting planets on 9.5 and 21 day periods respectively. The lightcurves were detrended using the pixel level decorrelation (PLD) algorithm to remove correlated detector noise. The goal of this work has been not only to study this system in greater detail, such as searching for transit timing variations to probe the possibility of additional planets, but also to prepare for the transition from K2 to TESS. A 550 hour proposal has already been accepted to use Spitzer to follow up planets discovered by the TESS mission, allowing Spitzer to continue to bolster the discoveries of other missions and contribute to our knowledge of extrasolar planets. As there is no publicly available pipeline for reducing Spitzer data, this work represents an important first step in preparing for the data that will be obtained by Spitzer when following up TESS planets.