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Abstract: Robert C. Morehead, Eric B. Ford

The cornucopia of Multiple Transiting Planet Systems (MTPS) will be one of Kepler's grandest legacies. Even though the false positive rate of MTPSs is expected to be lower than the bulk population of Kepler Candidates, care must still be taken to validate each system individually. One important step in this process is to test whether the transit events are produced by putative planets orbiting the target star or astrophysical false-positives, such as diluted eclipsing binaries and planets orbiting a different star in the photometric aperture. One effective method to determine stellar cohabitation is comparing the period-normalized transit duration ratios (ξ) of pairs of candidates in the MTPS. ξ is proportional to the host star's mean density, modulated by the putative planet's eccentricity and more strongly by the planet's impact parameter, necessitating Monte Carlo methods to explore the relevant likelihood functions for both MTPSs and the false-positive scenarios that can mimic their signal. We present updated MTPS and false-positive probabilities for a sample of Kepler MTPS candidates and discuss how common false-positive modes can vary from system to system.