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Title: Using TTV to explore the dynamical configurations of Kepler planets.
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Abstract: A transiting planet exhibits sinusoidal transit-time-variations (TTV) if perturbed by a companion near a mean-motion-resonance (MMR). Among the low-mass Kepler planets, the fraction of transiting planets that show TTV can be taken as a proxy for the intrinsic frequency of companions orbiting close to and inward of the 2:1 MMR.

We search for sinusoidal TTVs in more than 2600 Kepler candidates, using the publicly available Kepler light-curves (Q0-Q12). We find that the TTV fractions rise strikingly with the transit multiplicity. Systems where four or more planets transit enjoy four times higher TTV fraction than those where a single planet transits, and about twice higher than those for doubles and triples. In contrast, models in which all transiting planets arise from similar dynamical configurations predict comparable TTV fractions among these different systems. Our results therefore suggest that there are at least two different classes of Kepler systems, one closely packed and one more sparsely populated.