Search for Exoplanets Orbiting the Kepler Contact Binaries

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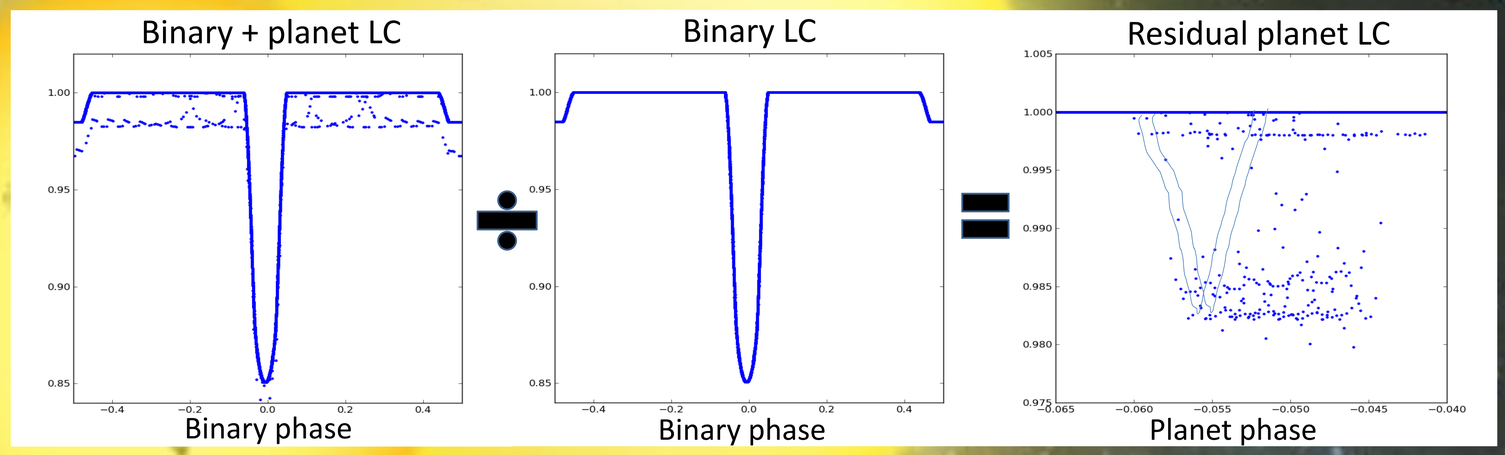
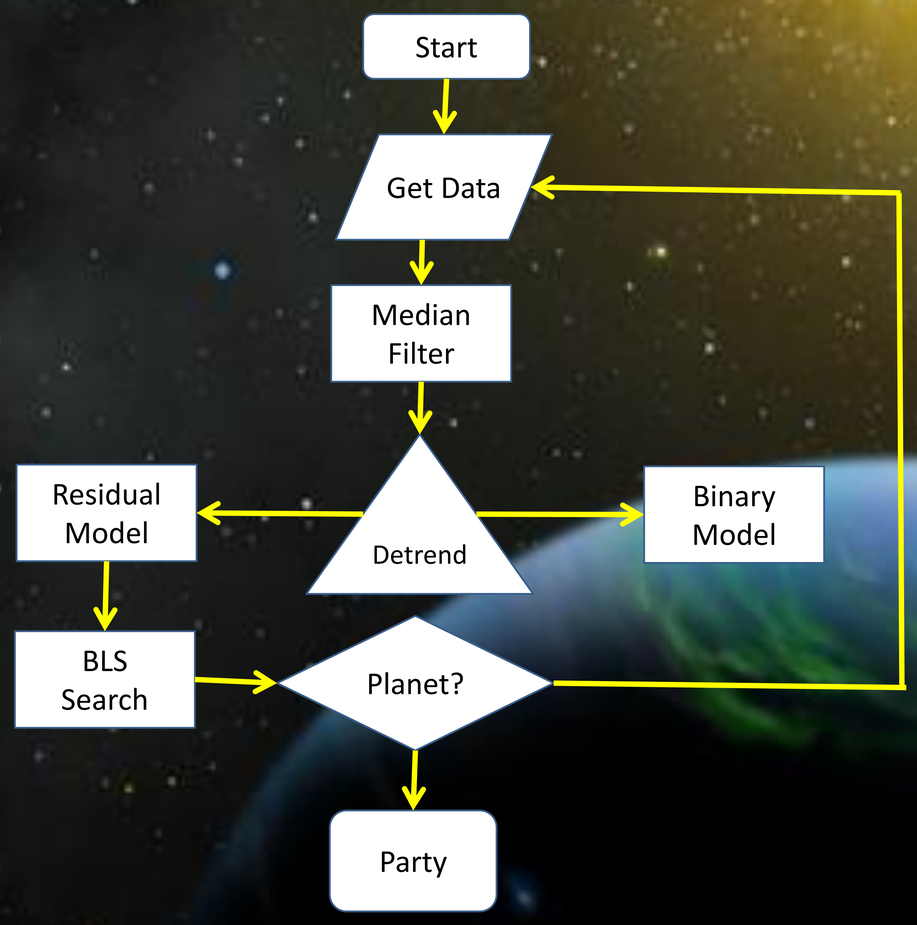
Abstract

The Kepler mission has uncovered a rich dynamical class of planets, circumbinary planets (CBPs), with Kepler-16b [Doyle et al. 2011], Kepler-34b & 35b [Welsh et al. 2012], and Kepler-47b & 47c [Orosz et al. 2012] as the most notable examples. Among this class, a few common features persist that may have implications for planetary formation within these systems. Specifically, the discovered CBPs have host binaries with orbital periods within 7-40 days and a planetary body orbiting near the inner stability boundary. No CBPs have yet been announced in orbit about contact binaries. The discovery of a CBP hosted by a contact binary will represent a new class of objects with a rich dynamical past and possibly present. We present the preliminary findings of our planet search within this subset of the Kepler data. The future goals for our investigation will also be discussed.

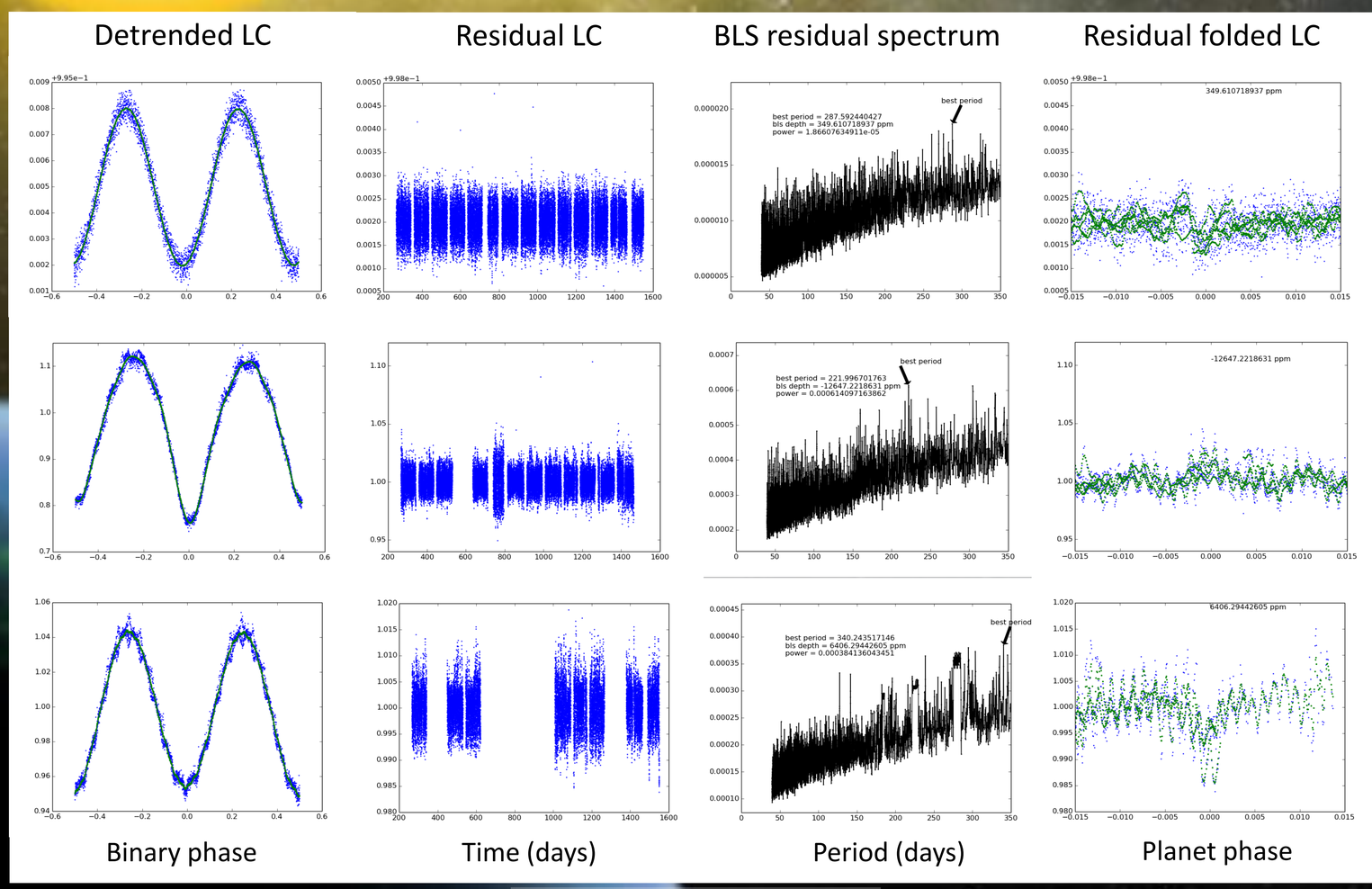
Possible 'Toy' Model



Method



Preliminary Results



References

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Conclusions

- No Detections yet
- Problems
  - Noise (long cadence sampling, stellar pulsations, etc.)
  - Variations in morphology between contact, semi-detached, and detached binaries
- Improvements in the Binary model are expected to allow for detections