



Kepler Confirmation of Multi-Planet Systems

William D. Cochran and the Kepler Science Team

McDonald Observatory, The University of Texas, Austin, TX, USA (wdc@astro.as.utexas.edu)

Abstract

The NASA *Kepler* spacecraft has detected 170 candidate multi-planet systems in the first two quarters of data released in February 2011 by Borucki et al. (2011). These systems comprise 115 double candidate systems, 45 triple candidate systems, and 10 systems with 4 or more candidate planets. The architecture and dynamics of these systems were discussed by Lissauer et al. (2011), and a comparison of candidates in single- and multi-planet systems was presented by Latham et al. (2011).

Proceeding from “planetary candidate” systems to confirmed and validated multi-planet systems is a difficult process, as most of these systems orbit stars too faint to obtain extremely precise (1 m s^{-1}) radial velocity confirmation. Here, we discuss in detail the use of transit timing variations (cf. e.g. Holman et al., 2010) to confirm planets near a mean motion resonance. We also discuss extensions to the BLENDER validation (Torres et al., 2004, 2011; Fressin et al., 2011) to validate planets in multi-planet systems.

Kepler was competitively selected as the tenth Discovery mission. Funding for the *Kepler* Mission is provided by NASA’s Science Mission Directorate. We are deeply grateful for the very hard work of the entire *Kepler* team.

References

- Borucki, W. J., et al. 2011, ApJ, in press
- Fressin, F., et al. 2011, ApJ, in press
- Holman, M. J., et al. 2010, Science, 330, 51
- Latham, D. W., et al. 2011, ApJ, 732, L24
- Lissauer, J. J., et al. 2011, ApJ, in press
- Torres, G., Konacki, M., Sasselov, D. D., & Jha, S. 2004, ApJ, 614, 979
- Torres, G., et al. 2011, ApJ, 727, 24