
Revisiting the CoRoT-7 system at a lower activity level

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Abstract

CoRoT-7b, the first super-Earth with measured radius discovered, has opened the new field of rocky exoplanets characterisation. CoRoT-7 was re-observed by CoRoT from the 10th of January 2012 to the 29th of March 2012 in the imagerie mode. During this run 90 new transits were obtained. These were combined with the previous 153 transits obtained in the discovery run and the radial velocity observations to derive accurate system parameters. A significant difference is found in the posterior probability distribution of the transit parameters between the previous CoRoT run (LRa01) and the new run (LRa06). I will argue that this is due to an extra noise component in the previous CoRoT run which we identify as transit spot occultation events. These lead to the combined transit shape becoming V-shaped and bias the estimated transit parameters. I will show that transits affected by spot occultation events have distorted shapes and present stellar activity induced transit time variations. Therefore, the transit times were used to select the transits that are less affected by activity in order to derive less biased system parameters. We show that ignoring stellar activity can lead to an incorrect interpretation of the system.

The CoRoT-7 system remains an excellent test bed for the effects of activity in the derivation of planetary parameters, in particular in the shallow transit regime.

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