

Model for Exomoons Detection Using Transits

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Main Objective: Build a model to simulate a planet+moon transit in front of the host star.

Motivation: Most of the planets discovered so far are gas giants, thus precluding their habitability. If some of these planets, however, have one or more moons, these might be habitable.

Method: The model, developed in IDL, simulates the star as a bright disk (with the corresponding limb darkening), whereas the planet and the moon are opaque disks. In each step, the program calculates the position of the planet and the moon, and estimates the star luminosity. The result is the lightcurve. The influence of dark spots on the stellar surface are also considered in the model.

Expected Results: We expect to determine whether these moons are detectable, and establish the detection limits.

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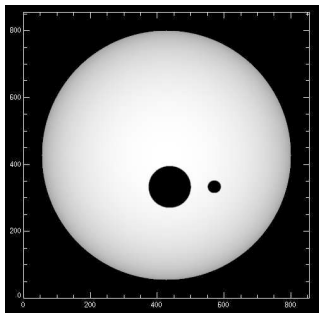


Figure: *Transit of CoRoT-2b with a moon added.*

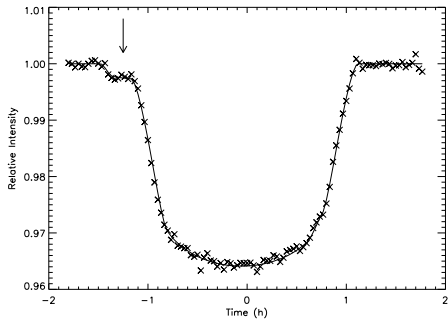


Figure: *Lightcurve generated by the model.*