

Search for sub-kilometre trans-Neptunian objects using CoRoT asteroseismology data: Part II

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Abstract

We present here the analysis of about 130k star hours of CoRoT (Convection Rotation and Planetary Transits) asteroseismology observations, which is in addition to the $\sim 144k$ star hours previously analyzed by Liu et al. We will report in this meeting how many more detections of possible occultation events (POEs) by analyzing these new data sets with the serendipitous stellar occultation method.

1. Introduction

Trans-Neptunian Objects (TNOs) are the witnesses of the formation of the planets during the dynamical and collisional period of our solar system. The population characteristics of sub-kilometer TNOs may carry some important clues for the origin of the planets. However, the knowledge of them is far from enough, particularly for those smaller ones, due to very few detections. Nowadays only TNOs larger than about 25 km can be directly observed. For the TNOs not able to be directly observed, searching for serendipitous stellar occultation events is a possible method. Currently, from the literature, only 15 POEs are reported from two serendipitous surveys: 2 POEs are found by Schlichting et al. using the observations taken by the Hubble Space Telescope's Fine Guidance Sensors, and the other 13 are found in our previous work using CoRoT data (Liu et al. 2015).

2. New CoRoT AN1 Lightcurves

The new CoRoT data contains 188 level-1 asteroseismology lightcurves from 77 stars monitored within 16 observation runs. The time resolution of these lightcurves is 1-sec. The longest lightcurve is about 130.4 days and the shortest one is 1.4 days. We are now working on analyzing these data, in total about 130k star hours. The result will help us to refine our

earlier estimate of TNO size distribution as shown in Figure 1.

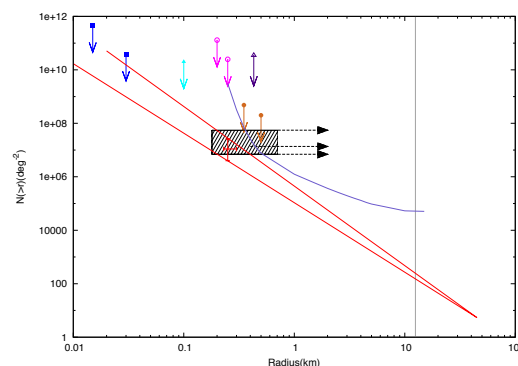


Figure 1: The size distribution derived from earlier CoRoT data (Liu et al. 2015).

References

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