PLATO's capability in detecting stellar tidal deformation due to transiting companion.

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Abstract

With the advent of PLATO, we will have the opportunity to visit a significant number of cool stars and associated transiting planets. The shape and motion of the host star are substantially affected by its planetary companions, the effect being larger as the planet to star mass ratio increases. The light curve of a transiting system such as a hot Neptune around a cool star provides information on the tidal shape and orientation of the host star, in addition to its rotational velocity. In this context, we predict the performance of PLATO over such systems with a particular focus on the detection of ellipsoidal variations. Since the tidal deformation of stars depends on their internal structure, the detection of ellipsoidal variations will allow us to test and validate current models for the interiors of M and K dwarfs.

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