

System Coupling and the Evolution of Short Period Planets

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Abstract

Planetary systems containing both close in and distant planets are common among the known extrasolar planets. The close proximity to the host star makes the characteristics and evolution of short period planets remarkable in a number of respects. These planets likely formed at larger stellar distance ($\gtrsim 3$ AU) and migrated inward. The intense radiation environment near the star subjects these planets to strong atmospheric flows and mass loss over the main sequence lifetime of the star. Tidal dissipation within the star and planet may result in substantial orbital migration and lead to planet engulfment by the star.

A planetary system's mass distribution determines the nature of its coupled orbital evolution - its dynamical structure. Consequently the evolution of short period planets is communicated through the planetary system as a whole. Planetary evolution tunes the characteristic orbital frequencies of the system, altering the partitioning and exchange of orbital angular momentum. In this presentation we will discuss how evolution of short period planets informs the orbital structure of planetary systems.