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Are hot Neptunes partially evaporated hot Jupiters?

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Abstract

The detection of short period planets (hot Jupiters and their lower mass counterparts, hot Neptunes and super-Earths) still defies the models of planet formation and evolution. Several possibilities have been proposed to explain the nature and formation process of the lower mass population, including in situ formation, disk migration, planet-planet scattering and kozai evolution, and the evaporation of a higher mass hot Jupiter. Using dynamical models and the best estimates for evaporation velocities, we show that under reasonable (and observed) physical conditions, hot Jupiter evaporation may explain the observed population of hot Neptunes/super-Earths.