

Theoretical prediction of distribution of extrasolar terrestrial planets

Shigeru Ida^{1*}

¹Tokyo Institute of Technology

In order to directly compare with observed data of extrasolar planets, we have constructed a numerical scheme to simulate the anticipated mass and semimajor axis distributions of planets based on a comprehensive treatment of the sequential planet formation scenario (Ida & Lin 2004a, b, 2005, 2008a, 2008b, ApJ). In the scheme, we first generate a set of protoplanetary disk models and integrate growth and orbital migration of protoplanetary seeds due to planetesimal accretion. If planetary masses become large enough, gas accretion onto the planets is added. We have tried to explain statistical features of observed data such as mass and semimajor axis distributions of gas giant planets and large terrestrial planets (super-Earths) and their dependences on metallicity and mass of host stars. With the theoretical model calibrated by the comparison with the observed data, we predict distributions of terrestrial planets in extrasolar planetary systems.

Keywords: extrasolar planets, planet formation, terrestrial planets