

Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



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Freeze out of planet inclinations in longterm exoplanet dynamics

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Recent studies on the Solar System have shown that the ergodic assumption is not verified for the secular chaos, with quantities being almost conserved over planetary systems' lifetime. In particular, the total inclination angular momentum deficit (AMD), which describes the average mutual inclination of the orbits is almost conserved. This is an unexpected result since the variables are strongly influencing each-other and exchanges occur for very inclined systems (e.g. Kozai-Lidov oscillations). This conservation has an implication for understanding how planetary system evolve over long timescales but as well to constrain the occurrence rate of multi-planetary systems as the detections are strongly impacted by the mutual inclination distribution. The goal of my study is to determine when the quasi conservation is valid for typical exoplanet systems configurations.

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