Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

PPS001-02 会場:101 時間:5 月 27 日 08:45-09:00

トロヤ群天体と太陽系の起源と軌道進化
Trojan Asteroids and the Early Evolution of the Solar System

ソフィアリカフィカ パトリック [1*], Jonathan Horner[2], Barrie Jones[3], 向井 正 [4]
Patryk Sofia Lykawka[1*], Jonathan Horner[2], Barrie Jones[3], Tadashi Mukai[4]

[1] 近畿大学 総合社会学部 (天文学分野), [2]University of New South Wales, [3]The Open University, [4] 神戸大学 理学研究科
[1]Faculty of Soc. & Nat. Sci., Kinki Univ., [2]University of New South Wales, [3]The Open University, [4]Graduate School of Science, Kobe Univ.

Trojan asteroids can be used to constrain Trojan formation mechanisms, giant planet formation/migration and the orbital structure in the asteroid and Kuiper belts. We performed numerical simulations totaling a few million massless objects under the gravitational influence of the four giant planets. Overall, Neptunian Trojans were obtained at the end of planet migration, composed of remaining local (primordial) and captured Trojan asteroids. In addition to Neptune, the other three giant planets were also able to capture and retain a significant population of Trojan objects from the planetesimal disk after planet migration. In general, captured Trojans yielded a wide range of eccentricities and inclinations, while local Trojans survived with colder orbital conditions. However, the bulk of captured objects decay over Gyr, providing an important source of new objects on unstable orbits (the Centaurs). Our results suggest the bulk of observed Jovian and Neptunian Trojan populations were captured from the primordial planetesimal disk during planet migration, but their high-i component (>20-25 deg) remain unexplained so far.

キーワード: エッジワース・カイパーベルト, 太陽系, 軌道共鳴, トロヤ群天体, 海王星, 太陽系外縁天体
Keywords: Edgeworth-Kuiper belt, Solar system, Orbital resonances, Trojan asteroids, Neptune, Trans-Neptunian objects (TNOs)