

# Resonant structure and stability of Trojans asteroids: evolution during the planetary migration

P. Robutel<sup>1</sup>      J. Bodossian<sup>2</sup>

1 IMCCE, observatoire de Paris, 77 avenue denfert rochereau 75014 Paris.

2 IMCCE, observatoire de Paris, 77 avenue denfert rochereau 75014 Paris.

## Abstract

One of the most important question about Jupiter's Trojans is to know where they come from: is the Trojan population primordial, or captured by Jupiter during the formation of the solar system? At the present moment the triangular equilibrium points  $L_4$  and  $L_5$  are stable, hence it is very difficult for an asteroid to escape from these regions or to be captured inside. Thus we could think the trojans as primordial. However, this point of view tend to consider a very static solar system in which Trojans appears during Jupiter's formation. This vision of a "frozen" solar system strongly evolves with the introduction of giant planets migration. We studied the effect of Saturn migration on the trojans Swarm using a frequency map analysis and computing numerous numerical integrations of Sun-Jupiter-Saturn+trojans system for different values of Saturn's semi- major axis. This helped us to understand which resonant structures evolve and might change the stability of Trojans population. I will present these families of resonances and an easy way to suspect their presence. Possibly I will also present a similar work on Saturn's trojans.