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Title: “*Space debris dynamics: resonances in the MEO*”

Abstract. The MEO region is the one hosting a large number of important operational satellites along with a significant population of space debris. From the dynamical point of view, the region is intersected by the tesseral 2 : 1 resonance as well as the lunisolar ones, and some secondary resonances emerge. The picture becomes even more complicated if the orbits of high eccentricity are considered. It is essential to understand thoroughly the dynamics of these resonances, for the sake of development of mitigation strategies. In this work, we aim to expand the analysis of the MEO region dynamics already performed by other authors (Celletti and Gales 2014; Daquin et al. 2015, 2016) onto those secondary resonances. We study the structures appearing in the stability maps of the region by the use of the MEGNO chaos indicator, taking into account various force models (the geopotential, the Sun and Moon attraction, and the solar radiation pressure). By means of the frequency analysis, we determine the resonant periods and amplitudes and identify the secondary resonances. We formulate an analytical model of local perturbed pendulum that would explain these structures.

Joint work with A. Lemaitre.