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**Title:** “*Quasi-periodic Motions of the Spatial Three-body Problem Related to Inner Rectilinear Motions*”

**Abstract.** In the context of KAM theory and the spatial three-body problem, specifically in the regime where the Hamiltonian can be split as the sum of two Keplerian systems plus a small perturbation, we deal with the quasi-periodic motions of the three bodies such that the two inner particles describe near-collision orbits. More precisely the inner particles never collide, but they follow orbits that are close to bounded straight lines. These solutions fill in invariant 5-tori and the motions occur either near the axis that is perpendicular to the invariable plane or near the invariable plane. The outer particle’s orbit has an eccentricity varying between zero and a value that is upper bounded by  $e_2^{\max} < 1$  and lies near the invariable plane. Our approach consists in a combination of a regularisation process with the construction of the reduced spaces at different levels and the explicit determination of sets of symplectic coordinates. Moreover we use an isoenergetic theorem by Han, Li and Yi on the existence of quasi-periodic solutions for Hamiltonian systems with high-order proper degeneracy. All these elements allow us to calculate explicitly the torsions for most possible combinations that the three particles’ orbits can achieve. Extensions to the  $N$ -body problem are briefly discussed.

This is a joint work with F. Sayas and P. Yanguas.