The dynamics around the collinear point $L_3$ of the RTBP.

**Esther Barrabés**
Dpto. Informática y Matemática Aplicada, Universitat de Girona
barrabes@ima.udg.es

**Josep M. Mondelo**
Dpto. Matemáticas, Universitat Autònoma de Barcelona
jmm@mat.uab.cat

**Mercè Ollé**
Dpto. Matemática Aplicada I, Universitat Politècnica de Catalunya
merce.olle@upc.edu

**Resumen**

We consider the Restricted Three Body Problem (RTBP), both the planar and spatial case, and we restrict our attention to the equilibrium point $L_3$. Our aim is centered in the description, as global as possible, of the dynamics around this equilibrium point. It is well known that $L_3$ is of type center $\times$ center $\times$ saddle, and the initial study of the local dynamics around $L_3$ gives two families of non-linear Lyapunov periodic orbits (associated with the two centers) and a 2-parametric (cantorian) family of 2-dimensional tori (see for example [3] and [2]).

In this work, we compute the objects in the center manifold of $L_3$, including the invariant manifolds associated to them. They are computed by purely numerical procedures, in order to avoid the convergence restrictions of the semi-analytical ones (typically used around $L_1$ or $L_2$). We also deal with homoclinic and heteroclinic connections between periodic orbits or invariant tori. In particular, we develop some numerical tools in order to compute homoclinic and heteroclinic orbits.

In [1], the behaviour of the invariant manifolds of $L_3$ as $\mu$ (the mass parameter of RTBP) increases was studied, as well as the homoclinic connections to $L_3$. In the present work we initially consider small values of $\mu$, as for them the homoclinic connections of $L_3$ are horseshoe-shaped. After that, other values of $\mu$ will be considered.

**Sección en el CEDYA 2007:** EDO: Session 1, Dynamical systems and celestial mechanics

**Referencias**

