Estimating the distance between the invariant manifolds of L_3 in the RCP3BP usign high precision methods

Inmaculada Baldom[1], **Ernesto Lanchares**, **Merc Oll**[2]

SUMMARY

A short time ago, in [1] and [2] an asymptotic for the distance of the invariant manifolds of L_3 in the RCP3BP when the mass parameter tends to zero was proven. In this work, we will approximate the values of the constants involved in the formula. To that end, we numerically estimate the distance between the manifolds using high precision methods and substitute the obtained values in the aforementioned formula. Moreover, we will use the inner equation of the problem to give better approximations of some of the constants involved. In the process we develop new algorithms and adapt preexisting methods to work with high precision floating point numbers.

Keywords: invariant manifold, Parameterization method, inner equation

AMS Classification: 34E15, 37D10, 37M21

References

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[2] BALDOM, INMACULADA AND GIRALT, MAR AND GUARDIA, MARCEL. Breakdown of homoclinic orbits to L3 in the RPC3BP (II). An asymptotic formula. *arXiv*.

[1]Departament de Matemàtiques
 Universitat Politècnica de Catalunya
 email: `immaculada.baldoma@upc.edu`

[2]Departament de Matemàtiques
 Universitat Politècnica de Catalunya
 email: `merce.olle@upc.edu`