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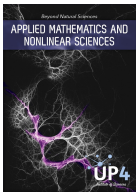

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On the central configurations of the n–body problem

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Abstract

We present a brief survey on some classes of central configurations of the n–body problem. We put special emphasis on the central configurations of the $1+n$–body problem also called the coorbital satellite problem, and on the nested central configurations formed by either regular n–gons, or regular polyhedra. We also present some conjectures.

Keywords: n-body problem, central configurations.
AMS 2010 codes: 70F15, 70F10, 37N05.

1 Introduction

1.1 The n–body problem

The *n–body problem* consists in studying the motion of n pointlike masses, interacting among themselves through no other forces than their mutual gravitational attraction according to Newton's gravitational law.

The *equations of motion* of the n–body problem are

$$m_k \mathbf{r}''_k = \sum_{j=1, j\neq i}^{n} \frac{G m_j m_k}{r_{jk}^3} (\mathbf{r}_j - \mathbf{r}_k),$$

for $k = 1, \ldots, N$, where G is the gravitational constant, $\mathbf{r}_k \in \mathbb{R}^3$ is the position vector of the punctual mass m_k in an inertial system, and r_{jk} is the Euclidean distance between the masses m_j and m_k.

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