

On the uniqueness of the isosceles trapezoidal central configuration in the 4–body problem for power-law potentials

Antonio Carlos Fernandes, Luis Fernando Mello

Instituto de Matemática e Computação, Universidade Federal de Itajubá,
Avenida BPS, 1303, Pinheirinho, CEP: 37.500-903, Itajubá, MG, Brazil

E-mail: acfernandes@unifei.edu.br

Claudio Vidal

Grupo de Investigación en Sistemas Dinámicos y Aplicaciones-GISDA, Departamento
de Matemática, Facultad de Ciencias, Universidad del Bío-Bío,
Casilla 5-C, Concepción, VIII-Región, Chile

E-mail: clvidal@ubiobio.cl

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Abstract. In this work we study the planar 4–body problem under homogeneous power-law potentials where the interaction between the bodies is given by r^{-a} , $a \geq 4/3$ (the Newtonian case corresponding to $a = 3$ and the vortex problem corresponding to $a = 2$). We study convex central configurations assuming two pairs of positive equal masses located at two adjacent vertices of a convex quadrilateral. Under these assumptions we prove that the isosceles trapezoid is the unique central configuration for every $a \geq 4/3$. For the case $0 < a < 4/3$, more difficult to study analytically, we make some numerical considerations.