

New stacked central configurations for the planar 5-body problem

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Abstract A stacked central configuration in the n -body problem is one that has a proper subset of the n -bodies forming a central configuration. In this paper we study the case where three bodies with masses m_1, m_2, m_3 (bodies 1, 2, 3) form an equilateral central configuration, and the other two with masses m_4, m_5 are symmetric with respect to the mediatrix of the segment joining 1 and 2, and they are above the triangle generated by $\{1, 2, 3\}$. We show the existence and non-existence of this kind of stacked central configurations for the planar 5-body problem.

Keywords Planar central configurations · n -body problem ·
Stacked central configurations · 5-body problem

1 Introduction

The classical *planar Newtonian n -body problem* in Celestial Mechanics consists in studying the motion of n pointlike masses in a fixed plane, interacting among themselves through no other forces than their mutual gravitational attraction according to Newton's gravitational law ([Newton 1687](#)).

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