Stability of the Stationary Solutions of the Differential Equations of Restricted Newtonian Problem with Incomplete Symmetry

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Abstract: We investigate the Lyapunov stability of the stationary solutions of the differential equations of restricted six-body problem with the gravitational centre. The gravitational field is created by bodies P_0, P_1, P_2, P_3 and P_4 with masses m_0, m_1, m_2, m_3 and m_4, respectively. In this gravitational field the movement of a body P with zero mass $(m = 0)$ is investigated. The bodies P_1, P_2, P_3 and P_4 form a rhombus, rotating uniformly around the centre of gravity P_0. In the article we have formulated necessary and sufficient conditions of Lyapunov stability and instability of equilibrium point of this model. All necessary analytical calculations are executed in the system of symbolical calculations (SSC) "Mathematica".

Keywords: *Hamiltonian systems; stability.*

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