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ON THE POINCARE'S PERIODIC ORBITS OF THE FIRST KIND IN THE MODIFIED PLANE RESTRICTED CIRCULAR THREE BODY PROBLEM

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Abstract. The problem of the existence of Poincare's periodic orbits of the first kind in the modified plane restricted circular three body problem is considered. It is supposed that the masses m_1, m_2 of two main bodies satisfy the condition $\mu=m_1/m_2 << 1$, the third body of zero mass moves subject to the jet force of the ionic engine and the attraction of main bodies. We assume that the jet acceleration is constant and directed on the fixed point of axis which connects the main bodies. On the basis of a method of small parameter the conditions of the existence of two set of periodic orbits are obtained. The first set has the constant period which is equal to the period of non perturbed circular orbit. The second set of orbits has the period depending on small parameter μ.

Keywords: Poincare's periodic orbits, three body problem, method of small parameter