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Saari's homographic conjecture for the planar equal-mass three-body problem under the Newton potential and a strong force potent

The Saari's homographic conjecture for N-body problem is the following: For the N-body problem under the homogenious potential $U = \sum m_i m_j / r_{ij}^{\alpha}$, the configurational measure $I^{\alpha/2}U$ is constant if and only if the motion is homographic. Here, m_i $(i = 1, 2, \ldots N)$ is mass for the body i, r_{ij} is the mutual distance between the body i and j and $I = \sum m_i m_j r_{ij}^2$ is the moment of inertia.

In this year, Fukuda, Ozaki, Taniguchi and the present author proved this conjecture for the planar equal-mass three-body problem under the Newton potential($\alpha = 1$) and the strong force potential($\alpha = 2$). In this talk, I will review our work.

This is a joint work with Hiroshi Fukuda, Hiroshi Ozaki and Tetsuya Taniguchi.