

Proof of the Saari's conjecture for the planar  
three-body problem with general masses under  
the Newton potential and a strong force potential

Toshiaki Fujiwara<sup>1</sup>, Hiroshi Fukuda<sup>1</sup>, Hiroshi Ozaki<sup>2</sup>,  
and Tetsuya Taniguchi<sup>1</sup>

<sup>1</sup>College of Liberal Arts and Sciences, Kitasato University, Japan

<sup>2</sup>General Education Program Center, Tokai University, Japan

The Saari's conjecture is a conjecture in the  $N$ -body problem under the homogeneous potential  $U = \sum m_i m_j / r_{ij}^\alpha$  ( $\alpha > 0$ ) which claims that a motion with constant configurational measure is homographic. Here, the configurational measure is defined by  $(\sum m_i m_j r_{ij}^2 / \sum m_k)^{\alpha/2} U$ , which is invariant under the rotation and the scale transformation.

We will show a proof of the Saari's conjecture for the planar three-body problem with general masses under the Newton potential ( $\alpha = 1$ ) and a strong force potential ( $\alpha = 2$ ).