

1018-37-260

Vadim Kaloshin* (kaloshin@its.caltech.edu), 218 McAllister Bldg, University Park, PA 16801, **Timothy Nguyen** (timothyn@caltech.edu), Mathematics 253-37, Caltech, Pasadena, CA 91125, and **Dmitry Pavlov** (dmitry@caltech.edu), Mathematics 253-37, Caltech, Pasadena, CA 91125. *Nonlocal instabilities in the planar three body problem.*

The Restricted Planar Circular 3 Body Problem (RPC3BP) which is the simplest nonintegrable 3 body problem. Usually it is viewed as a model for planar either Sun-Jupiter-Asteriod or Sun-Earth-Moon system. Stability v.s. instability of such a system is one of long standing problems. Using Aubry-Mather theory, Mather variational method, and numerical analysis, we managed to prove existence of rich variety of unstable motions. For example, an Asteriod could have a nearly elliptic orbit of say eccentricity 0.75 in the past and escape to infinity along nearly parabolic orbit of eccentricity more than 1 in the future. These motions could be interpreted as Arnold diffusion for this system. Instability results for RPC3BP imply instability for more nearby general planar 3 body problems. This is a joint work with T. Nguyen and D. Pavlov. (Received March 07, 2006)