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**Jinxin Xue\*** (jinxinxue@gmail.com), Rm 211, McAlister Building, Penn State University, State College, PA 16801. *Arnold diffusion in a planar 4-body problem.*

In this work, a model of planar 4-body problem is constructed to show the existence of Arnold diffusion. In the plane, we have the restricted planar circular 3-body problem(RPC3BP) formed by Sun, Jupiter and a massless asteroid. A fourth massive body is introduced to perturb the asteroid periodically. The result of the work is, the asteroid will have linear energy growth.

This underlying mechanism was proposed by Gelfreich and Turaev. Their mechanism is to exploit two hyperbolic periodic orbits and their heteroclinic intersections. One important feature of this mechanism is, the energy of the system has linear growth speed, which is very fast.

In the 4-body problem model, the mechanism is shown to work by studying the 2 Lyapunov periodic orbits surrounding the  $L_1$ , and  $L_2$  Lagrangian points in the RPC3BP.

This is an example of Arnold diffusion in the a priori chaotic case. (Received February 03, 2011)