Contribution ID: **42** Type: **not specified**

Split Invariant Curves In Rotating Bar Potentials

Friday, 10 December 2021 16:35 (5 minutes)

Invariant curves are generally closed curves in the Poincare´ surface of section. Here we study an interesting dynamical phenomenon, first discovered by Binney (1985) in a rotating Kepler potential, where an invariant curve of the surface of section can split into two disconnected line segments under certain conditions, which is distinctively different from the islands of resonant orbits. We first demonstrate the existence of split invariant curves in the Freeman bar model, where all orbits can be described analytically. We find that the split phenomenon occurs when orbits are nearly tangent to the minor/major axis of the bar potential. Moreover, the split phenomenon seems ‘‘necessary’’ to avoid invariant curves intersecting with each other. Such a phenomenon appears only in rotating potentials, and we demonstrate its universal existence in other general rotating bar potentials. It also implies that actions are no longer proportional to the area bounded by an invariant curve if the split occurs, but they can still be computed by other means.

Primary author: Ms XIA, Tianye (1Department of Astronomy, School of Physics and Astronomy, Shanghai Jiao Tong University)

Co-author: Prof. SHEN, Juntai (1Department of Astronomy, School of Physics and Astronomy, Shanghai Jiao Tong University)

Presenter: Ms XIA, Tianye (1Department of Astronomy, School of Physics and Astronomy, Shanghai Jiao Tong University)

Session Classification: Poster Session