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GRID SEARCH FOR SPATIAL AXI-SYMMETRIC HORSESHOE ORBITS IN RESTRICTED THREE
BODY PROBLEM**Abstract**

Our study presents a grid search approach for finding three dimensional axi-symmetric periodic orbits under the frame of restricted three body problem. This approach identify three dimensional horseshoe periodic orbit for each grid point without using initial analytical approximations. Each node is evaluated for detecting a nearby periodic solutions and then, differential correctors are applied to these initial conditions for obtaining periodic horseshoe orbits. We found the formation of loops decreases as we move away from L_3 from left. This results reduction in time period and complexing in shape of orbit. Families of spatial horseshoe orbits are generated and their properties are discussed. Moreover, stability indices are obtained corresponding to each horseshoe periodic orbit within each family and these are analyzed for stable and unstable three dimensional horseshoe orbits.