Chaotic Dynamics in the Two Body Problem on a Sphere

Sergey Bolotin

Steklov Mathematical Institute of RAS, Moscow, Russia

We prove the existence of chaotic trajectories for the two body problem on a sphere. The trajectories we construct encounter near collisions and are similar to the second species solutions of Poincaré of the classical 3 body problem. The construction uses a general result on Hamiltonian systems with Newtonian singularities.