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Simulation of Single-Particle Motion in Spheromak Geometries¹

PARTHIBAN SANTHANAM, UC-Berkeley, PAUL M. BELLAN, Caltech — A simulation of single-particle motion in electric and magnetic fields has been developed using a 'leapfrog' integration scheme in IDL. Calculations of particle trajectories in the Solov'ev solution to the Grad-Shafranov equation indicate good agreement with theory. Phenomena such as grad-B and curvature drifts, mirroring, and the conservation of energy and canonical angular momentum have been observed. It is planned to use this code to simulate single-particle motion in spheromak geometries, so as to aid in an analysis of particle trajectories in the field configurations of experimental spheromaks.

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