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Analysis of particle trajectories in a simulated, magnetized dusty plasma in a radially-increasing electric field[1] BRIAN BENDER, EDWARD THOMAS, Auburn University — Using the DEMON (Dynamic Exploration of Microparticle clouds Optimized Numerically) code, a molecular dynamics simulation of dusty plasma was performed. In this simulation, an initial grid of particles is subjected to a uniform magnetic field and a perpendicular electric field whose magnitude increases radially. To analyze the output of the simulation, a single particle was chosen and a Fourier analysis of its trajectory is performed, revealing two primary frequencies that contain information about the E x B drift motion and the gyromotion of the particle. If the electric field only increases linearly, the difference between the two frequencies is the cyclotron frequency, which agrees with analytical results. If the electric field model is modified by an exponential decay term, then the frequencies depend on the particle's initial conditions. These results will help us to understand the electric field configuration of the MDPX device as well as highlight interesting parameter regimes for further study.

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