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Using Single-Particle Motion Simulation to Optimize Coil Parameters for Inducing Autoresonant Heating in the PFRC[1] JACKEY LIU, SAMUEL COHEN, Princeton Plasma Phys Lab, ALAN H. GLASSER, University of Washington, IDO BARTH, Princeton University, PFRC TEAM — The heating of ions confined in a field-reversed configuration (FRC) equilibrium magnetic geometry subject to a small-amplitude, odd-parity rotating magnetic field (RMF) has previously been observed in single-particle Hamiltonian simulations. We consider a form of the autoresonance method to provide added heating capabilities. Two coils encircling the FRC were added near the X-points of the FRC, co-axial with the major axis; these may be used to add oscillating components, primarily to the axial field, stiffening or relaxing the field, shortening or lengthening the x-point distance. Various parameters of the simulations were modified, including the positions of the coils along the axis, the amplitude and frequency of the oscillations, as well as other FRC parameters to determine whether autoresonant heating is a feasible method for increasing ion heating. This work was support, in part, by DOE contract DE-AC02-09CH11466 and the Princeton Environmental Institute.

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