

Abstract Submitted
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A full-wave numerical simulation code for RF heating in weakly-inhomogeneous plasmas¹ C. TSIRONIS, A. PAPADOPOULOS, NTUA, Greece, A.K. RAM, PSFC - MIT, K. HIZANIDIS, A. SAMARAS, NTUA, Greece — The numerical code FWTOR is a full-wave solver of electromagnetic wave propagation in weakly inhomogeneous plasmas. It is based on the finite-difference time-domain method (FDTD), and simulates, using a least resource-demanding algorithm, wave propagation in one, two, or three spatial dimensions. The code consists of four basic parts: (1) the wave propagation solver; (2) a computation of the magnetic equilibrium based on a Hamiltonian model for magnetic field-line tracing; (3) the plasma response function for electron cyclotron waves based on the linear, weakly-relativistic, hot plasma dielectric tensor; (4) the convolutional perfectly matched layer (CPML) boundary conditions. We are in the process of code parallelization (mixed open MP-MPI) and the implementation of a fully-inhomogeneous plasma tensor. We will then have the capability to extend our analysis of wave propagation to the lower frequency lower hybrid and ion cyclotron waves. The inhomogeneous plasma model is based on a formalism of the dielectric tensor obtained from the kinetic equation containing the spatial derivatives of the distribution function. A description of the various algorithms and the structure of the code along with some numerical results for electron cyclotron wave propagation will be presented.

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