Calculation of plasma dielectric response in inhomogeneous magnetic field near electron cyclotron resonance[1] EVSTATI EVSTATIEV, VLADIMIR SVIDZINSKI, ANDY SPENCER, SERGEI GALKIN, FAR-TECH, Inc — Full wave 3-D modeling of RF fields in hot magnetized nonuniform plasma requires calculation of nonlocal conductivity kernel describing the dielectric response of such plasma to the RF field. In many cases, the conductivity kernel is a localized function near the test point which significantly simplifies numerical solution of the full wave 3-D problem. Preliminary results of feasibility analysis of numerical calculation of the conductivity kernel in a 3-D hot nonuniform magnetized plasma in the electron cyclotron frequency range will be reported. This case is relevant to modeling of ECRH in ITER. The kernel is calculated by integrating the linearized Vlasov equation along the unperturbed particle's orbits. Particle's orbits in the nonuniform equilibrium magnetic field are calculated numerically by one of the Runge–Kutta methods. RF electric field is interpolated on a specified grid on which the conductivity kernel is discretized. The resulting integrals in the particle's initial velocity and time are then calculated numerically. Different optimization approaches of the integration are tested in this feasibility analysis.

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