Abstract Submitted
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Coupling of Lower-Hybrid Full Wave and 3D Fokker-Planck Codes in Weak Damping Scenarios[1] S. FRANK, P. T. BONOLI, Massachusetts Institute of Technology, D. B. BATCHELOR, Oak Ridge National Lab, J. C. WRIGHT, I. H. HUTCHINSON, Massachusetts Institute of Technology — In the simulation of lower-hybrid current drive in tokamaks ray-tracing is currently the workhorse simulation tool used to design experiments. However, ray-tracing has yet to be extensively validated against full-wave simulations. Due to recent advancements in computation it is now possible to simulate lower-hybrid wave propagation in medium-sized tokamaks by a direct solve of the wave equation after it has been Fourier analyzed for a single frequency. Simulations such as these are of significant interest since they are capable of simulating weak-damping scenarios in modern tokamaks where current ray-tracing techniques assumptions could possibly break down. However, calculations of the non-Maxwellian damping of the lower-hybrid wave requires an iteration between the full-wave solver and a 3D Fokker-Planck solver in order to self-consistently model the wave fields. Techniques for iteration between the TORLH full wave and the CQL3D Fokker Planck codes by coupling the two codes with a quasi-linear RF diffusion coefficient will be shown and the results of these iterations and their implications for lower-hybrid current drive theory will be discussed.

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Samuel Frank
Massachusetts Institute of Technology

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