Abstract Submitted
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RF Sheath Models[1] D.A. D'IPPOLITO, J.R. MYRA, Lodestar Research Corporation — RF sheath formation on the antennas and walls in ICRF-heated experiments can reduce the heating efficiency, limit the coupled power, and cause damage to plasma-facing structures. The sheaths are driven by a slow wave component of the rf field due to a mismatch between the magnetic field and the boundary (antenna or wall). Quantitative modeling of the highly nonlinear sheaths may now be feasible for the first time in massively-parallel-processing (MPP) codes developed in the RF SciDAC project. Recently, a new approach to sheath modeling was proposed,[2] in which the sheath physics is incorporated into the RF wave computation by using a modified boundary condition (BC) on the RF fields in both wave propagation and antenna codes. Here, we illustrate the use of the sheath BC for near-field sheaths by a model calculation that includes electromagnetic effects and a simple antenna coupling model. Properties of the model (such as the role of sheath-plasma waves) and implications for antenna codes such as TOPICA[3] will be discussed.

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[2]D.A. D'Ippolito and J.R. Myra, Phys. Plasmas **13**, 102508 (2006).
[3]V. Lancellotti et al., Nucl. Fusion **46**, S476 (2006).

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