

Abstract Submitted
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Fullwave coupling to a 3D antenna code using Green's function formulation of wave-particle response¹ JOHN WRIGHT, P.T. BONOLI, MIT-PSFC, R. BILATO, M. BRAMBILLA, IPP-Garching, R. MAGGIORA, V. LANCELLOTTI, Politecnico di Torino, RF-SCIDAC COLLABORATION — Using the fullwave code, TORIC, and the 3D antenna code, TOPICA, we construct a complete linear system for the RF driven plasma. The 3D finite element antenna code, TOPICA, requires an admittance, \mathbf{Y} , for the plasma, where $B = \mathbf{Y} \bullet \mathbf{E}$. In this work, TORIC was modified to allow excitation of the (E_η, E_ζ) electric field components at the plasma surface, corresponding to a single poloidal and toroidal mode number combination (m,n) . This leads to the tensor response: $\mathbf{Y}_n = \begin{pmatrix} Y_{\eta\eta} & Y_{\eta\zeta} \\ Y_{\zeta\eta} & Y_{\zeta\zeta} \end{pmatrix}$, where each of the \mathbf{Y}_n submatrices is N_m in size. It is shown that the admittance matrix is equivalent to a Green's function calculation for the fullwave system and the net work done is less than twice a single fullwave calculation. The admittance calculation is used with loading calculation from TOPICA to construct self consistent plasma and antenna currents.

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