Fullwave coupling to a 3D antenna code using Green’s function formulation of wave-particle response\textsuperscript{1} JOHN WRIGHT, P.T. BONOLI, MIT-PSFC, R. BILATO, M. BRAMBILLA, IPP-Garching, R. MAGGIORA, V. LANCCELLOTTI, 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, $Y$, for the plasma, where $B = Y \cdot E$. In this work, TORIC was modified to allow excitation of the $(E_\eta, E_\zeta)$ 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: $Y_n = \begin{pmatrix} Y_{\eta\eta} & Y_{\eta\zeta} \\ Y_{\zeta\eta} & Y_{\zeta\zeta} \end{pmatrix}$, where each of the $Y_n$ 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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