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Fullwave coupling to a 3D antenna code using Green’s function formulation of wave-particle response. JOHN WRIGHT, PAUL BONOLI, MIT-PSFC, MARCO BRAMBILLA, Max-Planck Institute for Plasma Physics, VITO LANCELLOTI, RICCARDO MAGGIOIRA, Politecnico di Torino, MARK CARTER, ORNL, RF-SCIDAC TEAM — 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 the tensor response: $Y = \begin{pmatrix} Y_{\eta\eta} & Y_{\eta\zeta} \\ Y_{\zeta\eta} & Y_{\zeta\zeta} \end{pmatrix}$, where each of the $Y_n$ sub-matrices is $Nm$ in size. It is shown that the admittance matrix is equivalent to a Greens function calculation for the fullwave system and in addition, the net work done in the calculation is on the order of twice a single fullwave calculation. After the admittance calculation is done, the response of a plasma to an antenna driven at a given frequency can be calculated by only running the TOPICA code for a new antenna geometry. In tests of loading, TOPICA has been able reproduce loading of the Alcator D antenna (S12 coefficient accurately.).