3-D Time-Domain Simulations of ITER Antenna Modules with Edge Plasma*

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We have constructed computational three-dimensional geometry of ITER antenna modules using CAD information and component parametric descriptions. These are used in time-domain finite-difference simulations, done with the VORPAL software [1], to look at both vacuum and plasma loaded conditions. Simulations of a single module are presented, and progress on efforts to move to full array-sized simulations is reported on. We diagnose field profiles, surface field strengths, and impedance. Plasma loading is provided by a cold plasma model [2], which was designed to treat linear magnetized plasma response. This model easily treats non-axi-symmetric equilibrium, and we look at the effect of local high-density structures in front of the antenna. We also discuss progress in including non-linear effects in the edge plasma model, including time-dependant density, and sheath effects.

[1] Nieter, C. and Cary, J. R., JCP 196 (2004) 448-473.
[2] Smithe, D., Physics of Plasmas 14, 056104 (2007).

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