

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Simulation of RF Antenna Loading with 3-D Time-Domain Model Including Edge Plasma¹ DAVID SMITHE, TRAVIS AUSTIN, CHRISTINE ROARK, Tech-X Corporation — We use three-dimensional geometry of ITER and NSTX RF launchers in time-domain finite-difference simulations, done with the VORPAL software [1], to look at both vacuum and edge plasma loaded conditions. These simulations provide antenna loading measurements, including S-parameters, as measured in the coaxial feed lines. We import EQdisk data for the equilibrium plasma, and various models and measurement data to provide edge plasma profiles, including profiles with asymmetry in poloidal and toroidal directions. We are able to treat plasma that is in contact with the launchers, and even diffuse plasma within the antenna boxes. We also compute sheath potential for all surfaces, and report on progress in terms of making this model as self-consistent as possible. The simulation volumes requires office-cluster scale and super-computing scale platforms, and we also report on computational tradeoffs in terms of simulation volume, run-time, and cpu use.

[1] Nieter, C. and Cary, J. R., JCP 196 (2004) 448-473.

¹Work supported by US. DOE Grants DE-FG02-09ER55006 and DE-FC02-08ER54953.

David Smithe
Tech-X Corporation

Date submitted: 27 Jul 2011

Electronic form version 1.4