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Modeling of an ITER Antenna Module, in Vacuum, and with Facing Plasma DAVID SMITHE, JOHAN CARLSSON, TRAVIS AUSTIN, PETER STOLTZ, DAN KARIPIDES, Tech-X Corporation, RF SCIDAC TEAM — We report on the process of modeling the electromagnetic properties of a single ITER module, including Faraday screen, with the finite-difference time-domain software, VORPAL. CAD drawings and other descriptive materials are used to create an input file and geometry description suitable for EM modeling. Though finite-difference based, this software provides finite-element-like accuracy in the geometry representation, due to its cut-cell boundary capability. Parametric descriptions and enhancements are also used to resolve issues, add drive terms, and diagnostic features, and to insure reusability, e.g., for simulation of an entire antenna assembly in the future, and for installation into a larger toroidal-geometry simulation. Vacuum electromagnetic properties, such as peak fields and radiation impedance are measured, and compared with existing data, where possible. In addition, this software contains a time-domain plasma model that allows seamless integration with edge and possibly even internal plasma. An investigation of the electrical properties is then repeated for sensible edge plasma parameters.

David Smithe
Tech-X Corporation

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