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Advances in electron emission from conformal boundaries in the VORPAL code CHET NIETER, DAVID N. SMITHE, PETER H. STOLTZ, PAUL MULLOWNEY, KEVIN PAUL, JOHN R. CARY[1], Tech-X Corporation — Simulations of high-power microwave devices (HPM) involve the interaction of electrons with complex metal boundaries. Particle-in-Cell (PIC) methods are often used to model electrons when the velocity distribution is non-Maxwellian. The interaction of the PIC particles with the surfaces and the associated surface fields can be very challenging. We present recent advances in modeling electron surface effects at complex boundaries using the VORPAL code. These include accurate interpolation of the fields in cut cells on the boundary, secondary electron emission from conformal surfaces, and field emission of electrons from these surfaces. Discussion of the relevance to simulations of HPM devices with also be presented.

[1]also at University of Colorado

Chet Nieter
Tech-X Corporation

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