

Abstract Submitted  
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**Improved Field Emission Algorithms for Modeling Field Emission Devices Using a Conformal Finite-Difference Time-Domain Particle-in-Cell Method**<sup>1</sup> M.C. LIN, J. LOVERICH, P.H. STOLTZ, C. NIETER, Tech-X Corporation — This work introduces a conformal finite difference time domain (CFDTD) particle-in-cell (PIC) method with an improved field emission algorithm to accurately and efficiently study field emission devices. The CFDTD method is based on the Dey-Mitra algorithm or cut-cell algorithm, as implemented in the Vorpal code. For the field emission algorithm, we employ the elliptic function  $v(y)$  found by Forbes and a new fitting function  $t(y)^2$  for the Fowler-Nordheim (FN) equation. With these improved correction factors, field emission of electrons from a cathode surface is much closer to the prediction of the exact FN formula derived by Murphy and Good.

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M. C. Lin  
Tech-X Corporation

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