

## STATUS OF THE MICHELLE CODE AND APPLICATIONS\*

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The MICHELLE code [1], [2] is a Finite-Element Electrostatic Particle in Cell code for application to 2D and 3D particle beam formation, transport, and collection. Although its initial development focus had been for DC electron guns and depressed collectors, other applications such as RF electron guns, ion thrusters, photocathodes, etc. have become a recent focus. The MICHELLE code's ability to manage large mesh sizes and large particle counts in complex geometries requiring the resolution of disparate spatial scales in 2D and 3D on desktop computers has allowed it to be applied to devices that could not have been readily modeled in recent years. This presentation gives an overview of recent applications, capabilities, and the current status of MICHELLE. A gun optimization problem for a THz application will be presented. The effects of different modeling parameters and meshing techniques will be illustrated.

1. John Petillo, et al., "The MICHELLE Three-Dimensional Electron and Collector Modeling Tool: Theory and Design", IEEE Trans. Plasma Sci., vol. 30, no. 3, June 2002, pp. 1238-1264.
2. John Petillo, et al., "Recent Developments in the MICHELLE 2D/3D Electron Gun and Collector Modeling Code", IEEE Trans. Electron Devices Sci., vol. 52, no. 5, May 2005, pp. 742-748.

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\* Work supported by ONR and SAIC IR&D