Contribution ID: **1202** Type: **Invited**

THE MICHELLE CODE: LATEST FEATURES AND ADVANCED APPLICATIONS

Monday 24 June 2019 09:45 (30 minutes)

Beam optics for sources, transport and depressed electron collectors for RF component design and performance are predicted using simulation codes with ever more fidelity. To meet these modern day challenges, the MICHELLE charged particle beam optics code [1,2] has a new official release of Version 7 (2019), which contains a host of improvements including the physics solvers, user environments, user interface, interfacing with 3rd party codes and data, and the installation package. The physics solvers include new advances in thermionic emission, and modifications to the algorithms. The user environments include the previously-reported AFRL Galaxy Simulation Builder, but also improvements in the Analyst-MP environment. There are now options to use a wider variety of computation mesh grid generators, along with some advanced meshing techniques. This is taken advantage of with the ability to run MICHELLE under SolidWorks for device design, and for subsequent parametric optimization. The new software installers support UNIX & Windows, up through Windows 10.

This paper reports on the latest MICHELLE release and also will highlight the use of the new capability on advanced techniques for thermionic emission as well as extreme mesh examples of field emission arrays, illustrating how this capability can be used by the device designer.

1. John Petillo, et al., IEEE Trans. Plasma Sci., vol. 30, no. 3, June 2002, pp. 1238-1264.
2. John Petillo, et al., IEEE Trans. Electron Devices Sci., vol. 52, no. 5, May 2005, pp. 742-748.
3. Stellar Science Ltd Co. Galaxy Simulation Builder (GSB) User Guide, Version 6.6. High Power Electromagnetic Division, Air Force Research Lab, Kirtland, NM, 2017.

- Work supported by the ONR, NRL and Leidos

Authors: PETILLO, John (Leidos); BURKE, Alex (Leidos); JENSEN, Aaron (Leidos Corporation); Dr OVTCHINNIKOV, Serguei (Leidos); NELSON, Eric (Leidos); Dr STANTCHEV, George (U.S. Naval Research Laboratory); COOKE, Simon (U.S. Naval Research Laboratory); JENSEN, Kevin (Naval Research Laboratory); HELD, Ben (National Instruments); NICHOLS, Alan (National Instruments)

Presenter: PETILLO, John (Leidos)

Session Classification: 2.5 Codes and Modeling

Track Classification: 2.5 Codes and Modeling