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Guangming Yao* (gyao@clarkson.edu), Department of Mathematics, Clarkson University, 8 Clarkson Ave, PO BOX 5815, Potsdam, NY 13699-5815. *Meshless Simulations of Space Charge Effect in Field Emission from a Nanowire.*

This paper applies localized meshless method, the local method of approximate particular solutions (LMAPS), to simulate space charge effect in field emission from a nanowire. In the past, such simulation often done by finite difference method, finite element method and other mesh-based methods. However, mesh generation or integrations on meshes are needed, which reduces efficiency of the algorithm dramatically, if it is not impossible to use such numerical techniques. LMAPS developed recently is a truly localized meshless method, in which the random nodes in even an irregular domain are the only information needed in simulations. We simulate the role of the space charge effect in the I-V behaviour of a nanowire. Our simulation results have been compared with results from ANSYS, which have shown efficiency and accuracy of meshless method. (Received September 18, 2012)