

Abstract Submitted  
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**Validation of RF CCP Discharge Model against Experimental Data using PIC Method<sup>1</sup>** CASEY ICENHOUR, THERESA KUMMERER, North Carolina State University, DAVID L. GREEN, Oak Ridge National Laboratory, DAVID SMITHE, Tech-X Corporation, STEVEN SHANNON, North Carolina State University — The particle-in-cell (PIC) simulation method is a well-known standard for the simulation of laboratory plasma discharges. Using parallel computation on the Titan supercomputer at Oak Ridge National Laboratory (ORNL), this research is concerned with validation of a radio-frequency (RF) capacitively-coupled plasma (CCP) discharge PIC model against previously obtained experimental data. The plasma sources under simulation are 10-100 mTorr argon plasmas with a 13 MHz source and 27 MHz source operating at 50-200 W in both pulse and constant power conditions. Plasma parameters of interest in the validation include peak electron density, electron temperature, and RF plasma sheath voltages and thicknesses. The plasma is modeled utilizing the VSim plasma simulation tool, developed by the Tech-X Corporation. The implementation used here is a two-dimensional electromagnetic model, with corresponding external circuit model of the experimental setup. The goal of this study is to develop models for more complex RF plasma systems utilizing highly parallel computing technologies and methodology.

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