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**Plasma Simulation in the Multiphysics Object Oriented Simulation Environment MOOSE.** STEVEN SHANNON, North Carolina State Univ, ALEX LINDSAY, University of Illinois, DAVID GRAVES, University of California - Berkeley, CASEY ICENHOUR, DAVID PETERSON, North Carolina State Univ, SCOTT WHITE, MKS Instruments RF Power Division — MOOSE is an open source multiphysics solver developed by Idaho National Laboratory that is primarily used for the simulation of fission reactor systems; the framework is also well suited for the simulation of plasma systems given the development of appropriate modules not currently developed in the framework such as electromagnetic solvers, Boltzmann solvers, etc. It is structured for user development of application specific modules and is intended for both workstation level and high performance massively parallel environments. We have begun the development of plasma modules in the MOOSE environment and carried out preliminary simulation of the plasma/liquid interface to elucidate coupling mechanisms between these states using a fully coupled multiphysics model; these results agree well with PIC simulation of the same system and show strong response of plasma parameters with respect to electron reflection at the liquid surface. These results will be presented along with an overview of MOOSE and ongoing module development to extend capabilities to a broader set of research challenges in low temperature plasmas, with particular focus on RF and pulsed RF driven systems.

Steven Shannon
North Carolina State Univ

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