Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

**A Computational Framework for Efficient Low Temperature Plasma Simulations** ABHISHEK KUMAR VERMA, AYYASWAMY VENKATTRAMAN, School of Engineering, University of California Merced, Merced, CA 95343, USA — Over the past years, scientific computing has emerged as an essential tool for the investigation and prediction of low temperature plasmas (LTP) applications which includes electronics, nanomaterial synthesis, metamaterials etc. To further explore the LTP behavior with greater fidelity, we present a computational toolbox developed to perform LTP simulations. This framework will allow us to enhance our understanding of multiscale plasma phenomenon using high performance computing tools mainly based on OpenFOAM FVM distribution. Although aimed at microplasma simulations, the modular framework is able to perform multiscale, multiphysics simulations of physical systems comprises of LTP. Some salient introductory features are capability to perform parallel, 3D simulations of LTP applications on unstructured meshes. Performance of the solver is tested based on numerical results assessing accuracy and efficiency of benchmarks for problems in microdischarge devices. Numerical simulation of microplasma reactor at atmospheric pressure with hemispherical dielectric coated electrodes will be discussed and hence, provide an overview of applicability and future scope of this framework.

Abhishek Kumar Verma
Univ of California - Merced

Date submitted: 15 Jul 2016 Electronic form version 1.4