Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

**A Multiphase Computational Model for Non-Equilibrium Plasma Discharge in Gas Bubbles Immersed in Liquid** ASHISH SHARMA, DMITRY LEVKO, LAXMINARAYAN RAJA, University of Texas at Austin — Plasma generated by electrical discharges in gas bubbles suspended in liquids has found application primarily in liquid fuel reforming and plasma combustion. It is important to resolve the plasma discharge in both gas and liquid phases to accurately capture the physics of this discharge. Hence, in this work, we present a computational model for non-equilibrium plasma discharge in liquid phase and extend the existing computational framework for plasma discharge in gases to include both liquid and gas phases. The computational model is based on the self-consistent, multispecies continuum description of the plasma and solves the governing equations in both liquid and gas phases simultaneously. This new model considers the variations in the conductivity of the liquid dielectric for a more realistic description of the plasma discharge. The model also allows transport of charged and neutral species between gas and liquid phases through the bubble surface, where the transport terms in the liquid phase consists of both drift and diffusion terms.

Ashish Sharma
University of Texas at Austin

Date submitted: 02 Jun 2017 Electronic form version 1.4