Abstract Submitted
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Numerical Modeling of the Plasma-Liquid Interface using the Zapdos-CRANE Open-Source Package[1] SHANE KENILEY, DAVIDE CURRELI, University of Illinois at Urbana-Champaign, COREY DECHANT, STEVEN SHANNON, North Carolina State University — Plasma-liquid systems are experiencing growing interest due to their applications in medicine and chemical production. Even so, the chemical pathways in the interface region and the transport of electrons into the liquid phase remain poorly understood. In this work the plasma-liquid interface of a needle-on-water system is modeled with the MOOSE-based open source finite element model, Zapdos-CRANE. Zapdos is a plasma transport model previously used to study plasma-liquid interactions, while CRANE (https://github.com/lcpp-org/crane) is a plasma chemistry software written to solve reaction networks of arbitrary size. The coupled drift-diffusion-reaction model is utilized to study the chemical pathways of reactive oxygen species (ROS) in a fully-coupled 2D argon plasma-liquid water system. The impact of the electron surface loss coefficient on the formation of ROS at the liquid interface is investigated.

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