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Modeling solvated electron penetration depth and aqueous chemistry at the humid air plasma-water interface SHANE KENILEY, DAVIDE CURRELI, University of Illinois at Urbana-Champaign — Plasma-liquid systems are experiencing growing interest due to their applications in medicine and chemical production. In this work the interface of a humid air plasma impacting a water surface is modeled in the MOOSE-based open source finite element model, Zapdos-Crane. Electrons are allowed to directly penetrate the water interface through advection, and heavy species transport between gas and liquid phases is included through Henry's law. The effect on varying electron current density and oxygen concentration on penetration depth is studied. Preliminary results suggest that increasing electron current density increases solvated electron concentration at the interface but decreases penetration depth, a result corroborated by previous works. Chemical pathways leading to the production of reactive oxygen and nitrogen species in both the gas and liquid phases are also analyzed.

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