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3P52 - MODELING PLASMA SPECIES FORMATION FOR HIGH VOLTAGE ATMSOPHERIC COLD PLASMAS

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Atmospheric cold plasmas (ACPs) can effectively inactivate microorganisms in liquids and foods. Many ACP delivery mechanisms exist, including plasma jets and dielectric barrier discharges, with pulsed or AC applied voltages. Of note, are recent experiments considering the impact of high voltage ACPs (HVACPs), which apply tens of kilovolts across a several centimeter parallel plate gap, to improve food quality in liquid and solid foods [1]. Because reactive species formation plays a critical role in this phenomenon, previous studies have assessed HVACP species formation, particularly the influence of the boxes and bags used to contain the plasma during treatment [2].

This study attempts to provide a first step toward developing a predictive model for plasma species formation for HVACPs. Specifically, we consider a one-dimensional AC dielectric barrier discharge for a parallel plate geometry and couple it to BOLSIG+ to improve plasma species characterization [3]. The implication of HVACP conditions on species generation in gas, the potential influence of different food conditions (e.g. solid, liquid, or semi-solid), and long timescale plasma chemistry will be discussed.

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