Abstract Submitted
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Student Excellence Award Finalist: Atmospheric Pressure Plasma Multi-jets: Fundamental Properties[1] AMANDA M. LIETZ, University of Michigan, XAVIER DAMANY, JEAN-MICHEL POUVESLE, ERIC ROBERT, GREMI Universite d'Orleans, MARK J. KUSHNER, University of Michigan — A multi-jet plasma source is being developed for large area treatment of surfaces with atmospheric pressure plasma. The multi-jet source is a dielectric tube, capped at the end, with a row of holes aligned on one side. Helium flows through the tube and out the holes, where plumes of the He mix with ambient humid air. An ionization wave (IW) begins at a powered electrode upstream of the holes, propagates along the tube and, passing each hole, launches a separate, secondary ionization wave (SIW) through the hole which extends toward a grounded pump below. The parameters which effect this system have been investigated using *nonPDPSIM*, a 2-D plasma hydrodynamics model. The hole diameter determines the velocity of the SIW as it passes through the holes by controlling the angle of the electric field within the holes. A higher helium flow rate results in a larger region of purer helium outside of the tube, extending the distance the SIW can propagate outside of the hole before encountering air. Positive voltage polarity produces a plasma within the tube which does not hug the wall as tightly, and increases the intensity of the SIW outside of the tube. Comparisons will be made to experimental ICCD imaging of the primary IW and SIW, for which there is good agreement.

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Mark Kushner
Univ of Michigan - Ann Arbor

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