Abstract Submitted
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Optical Measurements of OH in an Atmospheric Plasma Jet for Plasma-Based Water Purification[1] RYAN GOTT, KUNNING XU, University of Alabama in Huntsville — Plasma-based water purification has been shown to remove more chemicals, waste materials, and bacteria than traditional treatment options. This process uses energetic plasma-generated electrons to induce chemical reactions that break down harmful molecules into benign components. A plasma source was developed for this purpose. The plasma jet works by feeding a propellant gas through a tube where it is ionized and pushed out as a plasma plume. The electrons from this plume react with water molecules to produce OH radicals, which drive the purification process. Changing the power operating conditions, gas flow rate, and tube size can change the size of the plasma plume and increase OH production. Voltages were varied from 7 to 10 kV, argon and helium were used at flow rates from 1.5 to 3 SLM, and the quartz tube ranged in length from 4 to 12 cm. The production of OH radicals has been studied using Optical Emission Spectroscopy, and compared for various plasma sizes. A Princeton Instruments Acton SP2500 Spectrometer was used with a PI-Max 4 ICCD Camera and a Hamamatsu H10722-01 PMT to look at the emission spectra. Work will continue to be done to improve the understanding of these phenomena, allowing for plasma purification methods to be better designed.

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Ryan Gott
University of Alabama in Huntsville

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