Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Efficiency of methylene blue in water purification using atmospheric plasma jet under varying conditions[1] MARISA THOMPSON[2], RYAN GOTT[3], KUNNING XU[4], University of Alabama in Huntsville — Globally 2.5 billion people are unable to access clean water. Advanced oxidation processes (AOPs), an accepted method of water purification, use hydroxide radicals (OH) to break down pollutants, but many AOPs employ harsh chemicals and are expensive. Low temperature, atmospheric pressure plasma (LTAPP) presents novel methods of creating AOPs to purify water. LTAPP provides a cheaper, greener method of purification because it can create plasma from ambient air and does not use chemical consumables such as ozone, hydrogen peroxide, or chlorine that need constant renewal. Thus the only cost associated with LTAPP purification is the cost of electricity to generate the plasma. The research presented studied the effects of different voltages, pulse widths, frequencies, and stand-off distances (SOD, distance from the edge of the plasma tube to the surface of the water) on water purification. Methylene blue dye (a known pollutant) in water was run at a set of standard conditions and tests were then run at conditions above and below standard conditions. The results of this research are presented in this work as an examination of total carbon content and a comparison of reduced methylene blue concentration and spectrometer measurements as a function of different plasma jet parameters.

[1]Supported by NSF grant 1655280
[2]Undergraduate Research Assistant
[3]Graduate Research Assistant
[4]Associate Professor

Kunning Xu
University of Alabama in Huntsville

Date submitted: 25 Jul 2019 Electronic form version 1.4