Measurement of OH Radical in an Atmospheric Plasma Generated on Water Surface BRANDON BYRNS, ALEX LINDSAY, KRIS FORD, STEVE SHANNO, DETLEF KNAPPE, NC State University — Hydroxyl radicals are a well-known oxidizing agent that has many uses in the removal of contaminants from materials in both liquid and gas phases. To this end, an atmospheric plasma, operated at 162MHz, is used for the production of dissociated reactive species through plasma enhanced vaporization, ionization and the functionalization of liquid precursors via non-thermal plasma treatment. A coaxial source is used that has all components DC grounded allowing for the flow of water through the device creating a layer of water on the surface of the powered electrode. The plasma can be completely sustained through the evaporation of water from the electrode without the need for noble gases or any other feedgas. Air can also be flown through the device with little effect on OH densities but can be used to change the shape of the discharge at the exit of the device, which could be desirable for different applications. The emission spectrum of the discharge is completely dominated by the emissions of the hydroxyl radical. Spatially resolved absorption spectroscopy is performed using a broadband white light source that only requires a single pass through the plasma. OH concentrations have been calculated to be $10^{14}$-$10^{16}$ cm$^{-3}$.

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