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An overview of plasma-in-liquid experimental studies at the University of Michigan's Plasma Science and Technology Laboratory[1] JOHN FOSTER, University of Michigan, CAMERON HOWARD, University of Maryland, BRADLEY SOMMERS, University of Michigan — Plasma production or plasma injection in liquid water affords one the opportunity to nonthermally inject advanced oxidation processes into water for the purpose of sterilization or chemical processing. Limitations of current injection approaches include limited throughput capacity, electrode erosion, and reduced process volume. Currently we are investigating two potential approaches to circumventing these issues. These include direct plasma injection using an underwater DBD plasma jet and the direct excitation of underwater isolated bubbles via a pulsed electric field. Presented here are results from these ongoing tests, which include a comparative study of the effectiveness of microdischarge, and plasma jet direct injection approaches on the decomposition of Methylene Blue dye. Additionally, an approach to excitation of isolated bubbles using pulsed electric fields is also discussed. Streamer propagation dynamics such as surface propagation and the observed excitation of surface waves on electrode-attached and free bubbles are also discussed.

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