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**Breakdown Voltage Scaling in Gas Bubbles Immersed in Liquid Water**[1] SARAH GUCKER, BRADLEY SOMMERS, JOHN FOSTER, University of Michigan — Radicals produced by the interaction of plasma with liquid water have the capacity to rapidly oxidize organic contaminants. This interaction is currently being investigated as a means to purify water. Direct plasma creation in water typically requires very high voltages to achieve breakdown. Igniting plasma in individual gas bubbles in liquid water on the other hand requires much less voltage. Furthermore, the use of an electrode-less plasma initiation in such bubbles is attractive in that it eliminates electrode erosion thereby circumventing the contamination issue. The breakdown physics of isolated bubbles in liquid water is still poorly understood. In this work, we investigate the relationship between applied voltage for breakdown and the associated pd. This is achieved by locating the breakdown voltage over a range of bubble sizes. This approach allows for the generation of a Paschen-type breakdown curve for isolated bubbles. Such a relationship yields insight into breakdown mechanics and even streamer propagation through water.

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