

Abstract Submitted
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Vortex Stabilized Plasma for Rapid Water Disinfection & Pharmaceutical Degradation ADY HERSHCOVITCH, Brookhaven National Laboratory — Good quality drinking water is dwindling for large segments of the world population. Aggravating the problem is proliferation of antibiotics in the water supply, which give rise to drug resistant pathogens. One option for water supply increase is recycling waste and polluted water by inexpensive, environmentally friendly methods. Presently disinfection uses chemicals and UV radiation. Chemicals are limited by residual toxicity, while UV consumes much electricity. Current methods can remove only certain classes of drugs due to their large variety of physical and chemical properties. Plasmas in water are very attractive for degrading all pharmaceuticals and deactivating pathogens: intense arc current can physically break up any molecular bonds. UV radiation, ozone, etc. generation inside the water volume disinfects. Present utilized plasmas: glow, pulsed arcs are not power efficient; vortex stabilized plasmas are power efficient that can advance water treatment state-of-the-art by orders of magnitude. Proposed technique features novel components facilitating large diameter vortex stabilized in-water arcs with optimized plasma parameters for maximal UV-C emission; and harvests hydrogen centered by the vortex.

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