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Simulations of induced nuclear reactions via electrostatic discharge in heavy-water hydrated dielectric media[1] GRANT MATHEWS, University of Notre Dame, DAVID CAPPELLETTI, LENR, LLC — We present numerical simulations of a novel concept for the low-cost initiation of D+D fusion reactions via electrostatic discharge in a dielectric medium. We have run simulations based upon a generalized fractal dielectric breakdown model to describe the development of bush-like and dendritic like discharge fractal structure in a dielectric crystal hydrated with heavy water, e.g. CuSO4·5D2O. We have generalized this model to allow for not only the electronic discharge structure but also the acceleration of positive ions during the development of the discharge. Simulations suggest that the dendritic structures persist for more than 100 microseconds. For a large enough applied voltage this is ample time to accelerate the positive deuterium ions to energies sufficient to induce nuclear reactions. Prospects for applications and scalability of this device are discussed.

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