

Abstract Submitted
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Spatial and Energy Profiling of D-D Fusion Reactions in an Inertial Electrostatic Confinement Fusion Device¹ DAVID DONOVAN, GERALD KULCINSKI, JOHN SANTARIUS, University of Wisconsin-Madison — The University of Wisconsin-Madison Inertial Electrostatic Confinement (IEC) Group utilizes highly transparent, concentric spherical electrodes to create a potential well that is used to accelerate charged particles towards the center of the well. The cathode is placed at a high voltage (10-100 kV) to accelerate deuterium ions to speeds that allow fusion to occur with background gas (2 mTorr), ions embedded in the cathode wires, and other fast particles. A new diagnostic has been developed that uses the time of flight (TOF) of the resulting fusion products to determine where the fusion event occurred along a radial line through the electrodes. The diagnostic is also capable of collecting the energy of the fusion reactants using the magnitude of the Doppler shift of the fusion products. The TOF diagnostic has been used with levels of accuracy never before achieved on an IEC device to collect spatial and energy profiles of the fusion reactions occurring along a radial line through a spherical IEC device while varying parameters such as background pressure, cathode voltage, and cathode design.

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David Donovan
University of Wisconsin-Madison

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