

Abstract Submitted
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Spatial and Energy Profiling of D-D Fusion Reactions in an Inertial Electrostatic Confinement Fusion Device¹ DAVID DONOVAN, DAVID BORIS, 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 spheres. The cathode is placed at a sufficiently high voltage to accelerate deuterium ions to such a speed as to allow fusion to occur with background, embedded, 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 along a radial line through the electrodes the fusion event occurred. 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 will be used 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, ion current, and spacing between electrodes with levels of accuracy never before achieved on an IEC device.

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