Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Ultra-Compact Electrostatic Confinement Fusion Device GARRETT YOUNG, None — A unique, linear dual-beam configuration with an internal volume of 144 cc was simulated and operated. Deuteron ion paths were simulated using *Mathematica* and the electric field distribution was optimized relative to convergence density, potential well efficiency, and confinement time. The resulting cathode design is a departure from conventional systems, with gradual conical surfaces. The simulated trajectories correlated well to the observed operation, evidenced by two principle factors. First, the high transparency of the cathode due to the focused beams allowed for >1 kW operation without duration-limiting temperature rise. Second, when compared to inertial electrostatic configurations, the constructed device achieved record steady-state D-D fusion rates per internal volume including 3.7E+4 fusions/sec/cc at 52 kV applied potential and 28 mTorr operating pressure.

Garrett Young
None

Date submitted: 10 Jul 2017 Electronic form version 1.4