Progress Towards Proof of Principle Applications Using Steady State D-³He Fusion

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Background

Inertial Electrostatic Confinement Theory Of Operation

1. Positive ions are created from the fuel gas near the outer grid, and the neutral gas, also creating fusion reactions.
2. The ions oscillate through the inner grid several times, creating a concentration of high energy ions in the central region.
3. The ions collide, creating fusion reactions.
4. The ions can also undergo charge exchange, creating fast neutrals.
5. High energy fusion products, such as protons and neutrons, are created and can be used in many different applications.
6. The ions are then accelerated towards the negatively charged inner grid.

Experimental Facility

University of Wisconsin IEC Facility

Steady State Fusion

Air Cooled Aluminum Chamber

Water Cooled Stainless Steel Chamber

Typical Runs

Solid State Proton Detector

Proton Energy Spectrum from Detector

D-³He Proton Counts from Detector

D-D Neutron Rate vs Cathode Voltage

Recent Progress

The Progress in Steady State Fusion Using Advanced Fuels Has Been Rapid

Medical Isotope Production

 Activation Spectrum

Medical Isotope Production

About 1 nCi ⁹⁴mTc Was Created
Using embedded fusion in solid molybdenum cathode

Steady State Production of Fusion Products Wisconsin IEC Fusion Reactor

D-D Neutron Rate vs Cathode Voltage

Maximum Voltage vs. Time

Downloadable Spectrum
Using water in circulator

Maximum Voltage vs. Time

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Using water in circulator