Fusion Reactions in Low Wattage Inertial Electrostatic Confinement Devices

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This experiment attempted to determine whether or not inertial electrostatic confinement based devices or “fusors” were capable of producing a detectable amount of fusion reactions with an input power of substantially below 200 Watts. As not many people are trying to find the least amount of power necessary to produce a detectable amount of fusions in this type of device, the figure of 200 Watts comes from the observations of an amateur group of fusion researchers focused on this type of device. 200 Watts is a lot of power and it is very difficult to acquire a power supply capable of producing this. As a result, this is a major barrier to constructing these and similar devices for the study of plasmas and fusion. Lowering the power requirement for detectable fusions could drastically expand the availability of this device to researchers. Ultimately the system was able to hold at a stable pressure of 510-3torr and voltage of 11.7 kV at 7.5 mA. Accounting for a total of 87.75 Watts, under half of the 200 Watt observation. During an approximately one hour run time 3 neutrons were detected via bubble dosimetry, and 24 neutrons were detected by a Helium-3 based probe run on 2 minute intervals every 10 min.

Awards Won:

Third Award of $1,000