Abstract Submitted
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Vortex Stabilized Compressed Fusion Grade Plasma[1] ADY HERSHCOVITCH, Brookhaven National Laboratory — Inertial confinement fusion schemes comprise of highly compressed dense plasmas. Some involve short pulses of powerful beams (lasers, particles) applied to solid pellets, while others utilize plasma focus to obtain dense pinch plasmas. Although compression factor >1000 has been achieved for starting pressures in the Torr range, the latter is limited by instabilities for initial gas density above 10 Torr. One alternative approach could be shooting electron beams through very dense, atmospheric pressure, vortex stabilized plasma. Large azimuthal magnetic generated by an electron beam can compress and heat the plasma to fusion viable parameters. This configuration is stable against sausage, kink, or beam – plasma instabilities. Based on experimental evidence beam propagation through the plasma is not be an issue. A second possibility is to tangentially squeeze a quasi-neutral plasma focus flow by a surrounding gas vortex. Based on currently available electron beams, the first scheme viability as an electrical power generating reactor does not seem to be promising. But using a plasma cathode electron beam that was developed a while ago, for which DOE has a patent U.S. Patent 4,942,339, could result in net generation of electricity. Calculations will be presented.

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