Abstract Submitted
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Fusion plasmas produced by femtosecond laser irradiation of clusters in a megagauss magnetic field[1] ROGER BENGTSON, University of Texas at Austin, SEAN LEWIS, HERNAN QUEVEDO, MATTHEW WISHER, JEFFERY KELLOG, BRIAN STOLZFUS, KENNETH STRUVE, CALEB WAUGH, Sandia National Laboratories — Interactions of intense femtosecond lasers with atomic clusters can create plasmas with high density (10^{19} cm^{-3}) and high average ion energies (10 keV) and significant numbers (10^7) of DD fusion neutrons can be produced. We have built and are testing a 2 MA driver to create a 200 T field that can be used on the Texas Petawatt laser to create a magnetized hot, dense deuterium plasma with a high neutron yield. A cooled gas jet will be used to produce deuterium clusters with radius $\sim$ 10 nm. The magnetic field is produced by a 10 capacitor (100 kV) low inductance bank that discharges through a 1 cm diameter coil in vacuum. First experiments will be done on the 2 J, 120 fs GHOST laser; later experiments are scheduled on the 180 J, 160 fs Texas Petawatt. Details and status of components will be presented.

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