Abstract Submitted
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MagLIF scaling on Z and future machines[1] STEPHEN SLUTZ, WILLIAM STYGAR, MATTHEW GOMEZ, EDWARD CAMPBELL, KYLE PETERSON, ADAM SEFKOW, DANIEL SINARS, ROGER VESEY, Sandia National Laboratories — The MagLIF (Magnetized Liner Inertial Fusion) concept [S.A. Slutz et al Phys. Plasmas 17, 056303, 2010] has demonstrated [M.R. Gomez et al., PRL 113, 155003, 2014] fusion–relevant plasma conditions on the Z machine. We present 2D numerical simulations of the scaling of MagLIF on Z indicating that deuterium/tritium (DT) fusion yields greater than 100 kJ could be possible on Z when operated at a peak current of 25 MA. Much higher yields are predicted for MagLIF driven with larger peak currents. Two high performance pulsed-power machines (Z300 and Z800) have been designed based on Linear Transformer Driver (LTD) technology. The Z300 design would provide approximately 48 MA to a MagLIF load, while Z800 would provide about 66 MA. We used a parameterized Thevenin equivalent circuit to drive a series of 1D and 2D numerical simulations with currents between and beyond these two designs. Our simulations indicate that 5-10 MJ yields may be possible with Z300, while yields of about 1 GJ may be possible with Z800.

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