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Compression of an Applied Bz field by a z-pinch onto a Tamped DT Fiber for Inertial Confinement Fusion[1] TOM NASH, Sandia National Lab — Simulations of a z-pinch compressing an applied 100 kG Bz field onto an on-axis DT fiber tamped with beryllium show the field reaching over 100 MG in the tamp, sufficient to confine DT alpha particles and to form a thermal barrier. The barrier allows the DT plasma to burn at a rho*r value as low as 0.045 g/cm^2, and at temperatures over 50 keV for a 63 MA drive current. Driving currents between 21 and 63 MA are considered with cryogenic DT fiber diameters between 600 μm and 1.6 mm. Pinch implosion times are 120 ns with a peak implosion velocity of 35 cm/μs. 1D simulations are of a foil pinch, but for improved stability we propose a nested wire-array. Simulated fusion yields with this system scale as the sixth power of the current, with burn fractions scaling as the fourth power of the current. At 63 MA the simulated yield is 521 MJ from 4.2 mg/cm of DT with a 37% burn fraction at a rho*r of only 0.18 g/cm^2.

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