

Abstract Submitted
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Fuel magnetization without external field coils (AutoMag)¹
STEPHEN SLUTZ, CHRISTOPHER JENNINGS, THOMAS AWE, GABE SHIPLEY, DEREK LAMPPA, RYAN MCBRIDE, Sandia National Laboratories — Magnetized Liner Inertial Fusion (MagLIF) has produced fusion-relevant plasma conditions on the Z accelerator where the fuel was magnetized using external field coils [S.A. Slutz et al. Phys. Plasmas 17, 056303 (2010); M.R. Gomez et al. Phys. Rev. Lett. **113**, 155003 (2014)]. We present a novel concept that does not need external field coils. This concept (AutoMag) magnetizes the fuel during the early part of the drive current by using a composite liner with helical conduction paths separated by insulating material. The drive is designed so the current rises slowly enough to avoid electrical breakdown of the insulators until a sufficiently strong magnetic field is established. Then the current rises more quickly, which causes the insulators to break down allowing the drive current to follow an axial path and implode the liner. Low inductance magnetically insulated power feeds can be used with AutoMag to increase the drive current without interfering with diagnostic access.

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