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Three Dimensional Magneto-Hydrodynamics Simulations of Auto-Magnetizing Imploding Liners for ICF.[1] JEFF WOOLSTRUM, Univ of Michigan - Ann Arbor, CHRIS JENNINGS, GABRIEL SHIPLEY, THOMAS AWE, STEPHEN SLUTZ, Sandia National Laboratories, NICHOLAS JORDAN, YY LAU, Univ of Michigan - Ann Arbor, KYLE PETERSON, Sandia National Laboratories, RYAN MCBRIDE, Univ of Michigan - Ann Arbor — AutoMag [Slutz et al., Phys. Plasmas 24, 012704 (2017)] is a potential next step in the magnetized liner inertial fusion (MagLIF) program. In standard MagLIF, external coils are used to magnetize deuterium gas inside a metal cylindrical liner, which is imploded by the Z-machine at Sandia National Laboratories. In AutoMag, helical slots are cut into the liner and filled with dielectric insulator to form a solenoid, producing an axial magnetic field from the drive current and removing the need for external field coils. Alternatively with external field coils, AutoMag could produce a field-reversed configuration inside the liner. Recent work at Sandia has found that the breakdown of the dielectric material corresponds to the geometry of the liner/dielectric. We explore this finding in 3D resistive-MHD simulations, modeling geometries relevant to both the 20-MA Z facility, and to the 1-MA MAIZE facility at the University of Michigan.

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Jeff Woolstrum
Univ of Michigan - Ann Arbor

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