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Progress, challenges, and plans for the MagLIF platform on Z

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The Magnetized Liner Inertial Fusion (MagLIF) concept combines fuel magnetization, laser preheat and compression of a fuel-filled liner with a pulsed power driver to achieve thermonuclear yields [1] [2]. The highest yields achieved to date of ~2×10^{13} DD built upon other advances to the platform [3] by including a dielectric (Parylene N) coated beryllium liner that maintains better implosion stability compared to bare beryllium [4]. This improvement is captured in 2D and 3D Hydra simulations that include extended MHD to better reproduce instability structures seen in experiments [5]. The simulations capture the observed stagnation conditions, including morphology, but suggest further improvements to stability may be necessary to achieve high yields on future pulsed power generators. The results highlight the importance of stability in MagLIF implosions, currently a key focus of our program.

References

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