

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Energy Coupling and LPI Dependencies in MagLIF Pre-Heat¹ MATTHIAS GEISSEL², ADAM J. HARVEY-THOMPSON, DAVID E. BLISS, JEFFREY R. FEIN, BENJAMIN R. GALLOWAY, MATTHEW R. GOMEZ, CHRISTOPHER JENNINGS, MARK W. KIMMEL, KYLE PETERSON, PATRICK RAMBO, JENS SCHWARZ, JONATHON E. SHORES, IAN C. SMITH, SHANE SPEAS, MATTHEW R. WEIS, JOHN L. PORTER, Sandia National Laboratories — The Magnetized Liner Inertial Fusion (MagLIF) program at Sandia National Laboratories is pursues magneto-inertial fusion concept on the Z-Accelerator. It involves pre-heating the deuterium fuel with the Z-Beamlet laser. In order to optimize pre-heat, dedicated laser-plasma studies at the Pecos target chamber are performed to develop an ideal laser configuration. Besides the general goal of increasing coupled energy, the experiments put a specific focus on losses from laser plasma instabilities (LPI). We present insights from varying fill density, fill gas (deuterium vs. helium), and laser pulse shape. For the latter, we show the results of varying the gap between pre-pulse that evaporates the window of the laser-entrance-hole(LEH) and the main pulse that heats the fuel.

¹Sandia National Laboratories is a multission laboratory managed and operated by National Technology Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energys National Nuclear Security Administration under contract DE-NA0003525.

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Date submitted: 10 Jul 2019

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