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Increasing Magnetic-Field Capability of MIFEDS Using an Inductively Coupled Coil D.H. BARNAK, P.-Y. CHANG, G. FIKSEL, R. BETTI, C. TAYLOR, Laboratory for Laser Energetics and Fusion Science Center, U. of Rochester — Magnetized high-energy-density plasma (HEDP) science is a very active and relatively unexplored field that has applications in inertial confinement fusion (ICF), astrophysical plasma science, and basic plasma physics. A self-contained device, the magneto-inertial fusion electrical discharge system (MIFEDS) was developed at the Laboratory for Laser Energetics to conduct magnetized HEDP experiments on both the OMEGA and OMEGA EP Laser Systems. Extremely high magnetic fields are a necessity for magnetized HEDP and continue to drive the redevelopment of the MIFEDS device. The MIFEDS device has recently been upgraded to quadruple the stored energy, reduce the internal impedance of the device, and double the magnetic field. A redesign of the MIFEDS targets allows for robust and repeatable operation and for accommodation of various experimental arrangements. A new design for an inductively coupled coil for MIFEDS is presented. Details of this new design and its performance are provided, as well as a brief overview of the critical design features and limitations. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944 and DE-FC02-04ER54789 (Fusion Science Center).

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