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Development of Field-Reversed Configuration Plasma Gun Formation Techniques for Magnetized Target Fusion ALAN LYNN, MARK GILMORE, TYLER WYNKOOP, University of New Mexico, THOMAS INTRATOR, THOMAS WEBER, Los Alamos National Laboratory — Magnetized Target Fusion (MTF) is an innovative approach for a relatively fast and cheap path to the production of fusion energy that utilizes magnetic confinement to assist in the compression of a hot plasma to thermonuclear conditions by an external driver. Los Alamos National Laboratory (LANL) is currently pursing demonstration of the MTF concept via compression of an FRC (field-reversed configuration) plasma by a metal liner z-pinch in conjunction with the Air Force Research Laboratory in Albuquerque, NM. A key physics issue for the FRC as an MTF target lies in the initial pre-ionization (PI) stage. The PI formation process determines the amount of magnetic flux that can be trapped to form the FRC. This trapped flux plays an important role in the FRC's final equilibrium, transport, and stability properties. It also provides the route to greatest potential gains in FRC lifetime, which is essential to provide enough time to translate and compress the FRC effectively. In conjunction with LANL we plan to test and characterize a new system to improve the initial PI plasma formation. This system will use an array of plasma guns to form the initial plasma. Initial characterization of the plasma gun behavior will be presented.

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