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**Development And Characterization Of A Liner-On-Target Injector For Staged Z-Pinch Experiments**[1] J. C. VALENZUELA, F. CONTI, I. KRASHENINNIKOV, J. NARKIS, F. BEG, University of California, San Diego, F. J. WESSEL, H. U. RAHMAN, Magneto-Inertial Fusion Technologies, Inc. — We present the design and optimization of a liner-on-target injector for Staged Z-pinch experiments. The injector is composed of an annular high atomic number (e.g. Ar, Kr) gas-puff and an on-axis plasma gun that delivers the ionized deuterium target. The liner nozzle injector has been carefully studied using Computational Fluid Dynamics (CFD) simulations to produce a highly collimated 1 cm radius gas profile that satisfies the theoretical requirement for best performance on the 1 MA Zebra current driver. The CFD simulations produce density profiles as a function of the nozzle shape and gas. These profiles are initialized in the MHD MACH2 code to find the optimal liner density for a stable, uniform implosion. We use a simple Snowplow model to study the plasma sheath acceleration in a coaxial plasma gun to help us properly design the target injector. We have performed line-integrated density measurements using a CW He-Ne laser to characterize the liner gas and the plasma gun density as a function of time. The measurements are compared with models and calculations and benchmarked accordingly.

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