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Simulation of Plasma Jet Driven MTF[1] ROMAN SAMULYAK, Stony Brook University, WEN WU, PAUL PARKS, General Atomics — Numerical simulations of the supersonic plasma jet driven MTF have been performed using the FronTier code. The plasma jet MTF concept uses a spherical array of converging high Mach number plasma jets to form a "plasma liner" that further converges to compress a magnetized plasma target to fusion conditions. We present 2D and 3D fluid dynamic simulations of a single plasma jet prior to merging, and 1D and 2D simulations of the imploding liner. 2D simulations of the implosion focus on the formation and evolution of the Rayleigh Taylor instability and its impact on the increase of the liner density and ram pressure. Work on 3D simulations of the merging of jets and formation of oblique shocks is underway. FronTier simulations of detached jets, performed with explicit tracking of material interfaces, are compared to FLUENT simulations in order to quantify the role of numerical diffusion. Results of numerical studies are compared with theoretical predictions of [P.B. Parks, Phys. Plasmas 15, 062506 (2008)].

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