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Idealized modeling of merging plasma jets in two dimensions using Nautilus JOHN LOVERICH, AMMAR HAKIM, Tech-X Corporation — PLX is a new experiment at LANL investigating imploding plasma liners formed via merging plasma jets. The imploding plasma liner is envisioned as a standoff driver for MIF. In this paper idealized merging argon plasma jets are simulated in 2D using both gas dynamic and MHD models using the Tech-X fluid plasmas code Nautilus. Results indicate that peak pressures of several hundred kilobar can be achieved for PLX-relevant jet parameters. Including a simple optically thin Bremsstrahlung radiation model and plasma targets shows that extremely high densities and magnetic fields can be achieved during jet merging on the order of 1000 times the initial density/field. This result is highly dependent on plasma radiation and therefore further investigations should include detailed ionization processes and multiple species. In addition, more accurate radiation modeling is also necessary to properly describe the radiation transport. At PLX-relevant Mach numbers and densities, atomic physics and radiation are also expected to be important during the jet merging process.

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