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Eulerian and Lagrangian Plasma Jet Modeling for the Plasma Liner Experiment RICHARD HATCHER, JASON CASSIBRY, MILOS STANIC, The University of Alabama at Huntsville, JOHN LOVERICH, AMMAR HAKIM, Tech-X Corporation — The Plasma Liner Experiment (PLX) aims to demonstrate the feasibility of using spherically-convergent plasma jets to from an imploding plasma liner. Our group has modified two hydrodynamic simulation codes to include radiative loss, tabular equations of state (EOS), and thermal transport. Nautilus, created by TechX Corporation, is a finite-difference Eulerian code which solves the MHD equations formulated as systems of hyperbolic conservation laws. The other is SPHC, a smoothed particle hydrodynamics code produced by Stellingwerf Consulting. Use of the Lagrangian fluid particle approach of SPH is motivated by the ability to accurately track jet interfaces, the plasma vacuum boundary, and mixing of various layers, but Eulerian codes have been in development for much longer and have better shock capturing. We validate these codes against experimental measurements of jet propagation, expansion, and merging of two jets. Precursor jets are observed to form at the jet interface. Conditions that govern evolution of two and more merging jets are explored.

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