Abstract Submitted
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Simulation of Plasma Jet Merger and Liner Formation within the PLX-α Project[1] ROMAN SAMULYAK, Stony Brook University / Brookhaven National Laboratory, HSIN-CHIANG CHEN, WEN SHIH, Stony Brook University, SCOTT HSU, Los Alamos National Laboratory — Detailed numerical studies of the propagation and merger of high Mach number argon plasma jets and the formation of plasma liners have been performed using the newly developed method of Lagrangian particles (LP). The LP method significantly improves accuracy and mathematical rigor of common particle-based numerical methods such as smooth particle hydrodynamics while preserving their main advantages compared to grid-based methods. A brief overview of the LP method will be presented. The Lagrangian particle code implements main relevant physics models such as an equation of state for argon undergoing atomic physics transformation, radiation losses in thin optical limit, and heat conduction. Simulations of the merger of two plasma jets are compared with experimental data from past PLX experiments. Simulations quantify the effect of oblique shock waves, ionization, and radiation processes on the jet merger process. Results of preliminary simulations of future PLX-*alpha* experiments involving the $\sim \pi/2$-solid-angle plasma-liner configuration with 9 guns will also be presented.

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