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Simulations of Plasma-Liner Formation and Implosion for the PLX-α Project[1] ROMAN SAMULYAK, Brookhaven National Laboratory, JASON CASSIBRY, KEVIN SCHILLO, University of Alabama at Huntsville, WEN SHIH, Stony Brook University, KEVIN YATES, SCOTT HSU, Los Alamos National Laboratory, PLX-ALPHA COLLABORATION — Detailed numerical studies of the propagation and merger of high-Mach-number plasma jets and the formation and implosion of plasma liners have been performed using the FronTier and SPH codes enhanced with radiation, physical diffusion, and plasma-EOS models. These simulations support the Plasma Liner Experiment-ALPHA (PLX-α) project (see S. Hsus talk in this session). Simulations predict properties of plasma liners, in particular 4π-averaged liner density, ram pressure, and Mach number, the degree of non-uniformity, strength of primary and secondary shock waves, and scalings with the number of plasma jets, initial jet parameters, and other input data. In addition to direct analysis of liner states, simulations also provide synthetic data for direct comparison to experimental data from a multi-chord interferometer and survey and high-resolution spectrometers. Code verification and comparisons as well as predictions for the first series of PLX-α experiments with 6 and 7 jets will be presented. Verified against experimental data, both codes will be used for predictive simulations of plasma liners for PLX-α experiments and potential scaled-up future experiments.

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