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Numerical studies on plasma jets and minirailguns at HyperV
LINCHUN WU, F. DOUGLAS WITHERSPOON, HyperV Technologies Corp.,
DALE R. WELCH, Voss Scientific, LLC, MICHAEL W. PHILLIPS, Advanced Energy Systems — Computational study of plasma jets using contoured gap coax and parallel plate minirailguns are underway using helium, argon and xenon plasmas with injection speeds of up to 10-20 km/s and plasma density of 10^{15} - 10^{17} cm⁻³. The study is performed using the recently improved Lsp code, which now implements a new sheath model and direct implicit algorithms enabling more accurate and faster simulations. The new radiation transport model in Lsp, with atomic data from Prism, is used in these 2D simulations. Results are shown and compared between these high-Z plasma species. Blow-by instability and restrike are observed in these simulations and will be discussed. The effects of ion stripping on high-Z plasma acceleration in the railguns will be studied as well using available atomic data. Work supported by the U.S. DOE Office of Fusion Energy Sciences.

Linchun Wu
HyperV Technologies Corp.

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