

Abstract Submitted
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Hybrid PIC Simulations of Particle Dynamics in Coaxial Plasma Jet Accelerators¹ CARSTEN THOMA, THOMAS HUGHES, DALE WELCH, Voss Scientific, PETER HAKEL, University of Nevada Reno — We describe the results of 1D and 2D simulations of plasma jet accelerators using the particle-in-cell (PIC) code Lsp. Previous studies of 1D cartesian simulations have shown that ion particle dynamics at the plasma-vacuum interface depend critically on the local Hall parameter, which is strongly dependent on electron temperature. In a coaxial accelerator with finite transverse dimensions, large transverse ion motions, predicted at moderate Hall parameters in 1D, can lead to ion loss to the walls. The results of 2D $r - z$ jet simulations are described and compared with the 1D cartesian results. The effects of particle loss and ablation at the wall are considered, as are electron heating mechanisms at the plasma-vacuum interface, including radiation losses. We will apply the results to the plasma jet experiments underway at HyperV Technologies Corp.

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