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Modeling of plasma jet production from rail and coaxial guns for imploding plasma liner formation* R.J. MASON, R.J. FAEHL, R.C. KIRKPATRICK, RAC, D. WITHERSPOON, HyperV, J. CASSIBRY, UAH — We study the generation of plasma jets for forming imploding plasma liners using an enhanced version of the ePLAS implicit/hybrid model.[1] Typically, the jets are partially ionized D or Ar gases, in initial 3-10 cm long slugs at 10^{16}-10^{18} electron/cm^3, accelerated for microseconds along 15-30 cm rail or coaxial guns with a 1 cm inter-electrode gap and driven by magnetic fields of a few Tesla. We re-examine the $B-$field penetration mechanisms that can be active in such wall-connected plasmas,[2] including erosion and EMHD influences, which can subsequently impact plasma liner formation and implosion. For the background and emitted plasma components we discuss optimized PIC and fluid modeling techniques, and the use of implicit fields and hybridized electrons to speed simulation. The plasmas are relatively cold ($\sim$3 eV), so results with fixed atomic Z are compared to those from a simple analytic EOS, and allowing radiative heat loss from the plasma. The use of PIC ions is explored to extract large mean-free-path kinetic effects. 1. R. J. Mason and C. Cranfill, IEEE Trans. Plasma Sci. **PS-14**, 45 (1986) 2. R. Mason, et al., Phys. Fluids **B, 5**, 1115 (1993).

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