

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Steps to Higher Density on the HyperV Plasma Guns¹ F. DOUGLAS WITHERSPOON, ANDREW CASE, SARAH MESSER, RICHARD BOMGARDNER, SAM BROCKINGTON, HyperV Technologies Corp. — We describe steps underway to substantially increase the density and shorten the length of plasma jets under development at HyperV for fusion and HEDP applications. The basic approach uses symmetrical pulsed injection of high density plasma into a coaxial EM accelerator having a cross-section tailored to prevent formation of the blow-by instability. Efforts to date have been successful at producing jets with high total momentum, but the jet density is only about $5 \times 10^{15} \text{ cm}^{-3}$, due primarily to the low currents and energies used to date. Present efforts are focused on upgrading the pfn's for both injection and main EM section. By increasing the injected mass, shortening the injected pulse time, and increasing the main drive current from $< 200 \text{ kA}$ to $0.5\text{-}1.0 \text{ MA}$, we expect to see jet densities increase to the $10^{16} \text{ cm}^{-3} - 10^{17} \text{ cm}^{-3}$ range and jet lengths to contract. Upgrades to the TwoPi facility have resulted in an order of magnitude increase in density to $> 2 \times 10^{17} \text{ cm}^{-3}$ at the implosion center by using top and bottom confining plates and higher energy driving the 64 capillary jets.

¹Work supported by the U.S. DOE Office of Fusion Energy Sciences.

Franklin Witherspoon
HyperV Technologies Corp.

Date submitted: 21 Jul 2008

Electronic form version 1.4