

Abstract Submitted  
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**High Current Systems for HyperV and PLX Plasma Railguns<sup>1</sup>** S. BROCKINGTON, HyperV Technologies Corp., A. CASE, S. MESSER, R. ELTON, F.D. WITHERSPOON — HyperV is developing gas fed, pulsed, plasma railgun accelerators for PLX and other high momentum plasma applications. The present 2.5 cm square-bore plasma railgun forms plasma armatures from high density neutral gas (argon), preionizes it electrothermally, and accelerates the armature with 30 cm long parallel-plate railgun electrodes driven by a pulse forming network (PFN). Recent experiments have successfully formed and accelerated plasma armatures of  $\sim 4$  mg at 40 km/s, with PFN currents of  $\sim 400$  kA. In order to further increase railgun performance to the PLX design goal of 8 mg at 50 km/s, the PFN was upgraded to support currents of up to  $\sim 750$  kA. A high voltage, high current linear array spark-gap switch and flexible, low-inductance transmission line were designed and constructed to handle the increased current load. We will describe these systems and present initial performance data from high current operation of the plasma rail gun from spectroscopy, interferometry, and imaging systems as well as pressure, magnetic field, and optical diagnostics. High current performance of railgun bore materials for electrodes and insulators will also be discussed as well as plans for upcoming experimentation with advanced materials.

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