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Characterization of jet-driven shocks in multi-ion-species plasmas[1] MAXIMILIAN SCHNEIDER, AMEER MOHAMMED, MATTHEW CARRIER, ANDREW WATSON, COLIN ADAMS, Virginia Tech — Collisions are induced in high velocity ($\sim$ 15 km/s), low density ($\sim 10^{16}$ cm^{-3}) plasma jets accelerated by a small linear plasma-armature railgun. The railgun is gas-fed with pure argon which mixes with both low and high-Z impurities ablated from the guns plasma-facing components to produce a multiple-ion species plasma jet. Characteristics of free-expanding jets inferred from a full suite of diagnostics including a two-chord Mach-Zehnder heterodyne interferometer, 750 mm high-resolution imaging spectrograph, and intensified CCD camera suggest that jets are low temperature ($\sim$ 2 eV) and initially exist in a collisional regime, resulting in a centimeter-scale shock structure when jets collide with stagnant plasma. Preliminary results provide insight regarding the spatial distribution of ion species before and after the collision. Repeatability of structures observed during collisions and prospects for control of jet composition will also be addressed.

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