

Abstract Submitted
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Initial comparison of low mass, high current alumino-silicate ion sources DAVID BACA¹, LBNL, LBNL TEAM² — Near-term High Energy Density Physics (HEDP) experiments prefer low mass ion sources and high current density. Thermionic emission from solid materials, such as, large diameter (2-10 cm) K⁺ alumino-silicate surface ionization emitters have proven to be very reliable, long-lived, and supply current densities in the range of 2.5-10.0 mA/cm² for several experiments including the High Current Experiment (HCX) and Neutralized Drift Compression Experiment (NDCX). Recently, low mass alkali alumino-silicate materials coated onto porous tungsten substrates were fabricated and their space-charge limited ion emission properties were measured at an extraction electric field of 40 kV/cm and pulse duration of 20 μ s. In our presentation, Li⁺ and Na⁺ alumino-silicate ion sources will be compared to the previously characterized K⁺ and Cs⁺ alumino-silicate emitters. This data will show that either sodium or lithium ion sources can meet HEDP requirements.

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