

Abstract Submitted  
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**Dependence of the Back-Streaming Ion Current on the Self-Magnetic Pinch (SMP) Electron Diode Parameters**<sup>1</sup> MICHAEL MAZARAKIS, MARK JOHNSTON, MARK KIEFER, JOSH LECKBEE, DAN IESEN, TIMOTHY RENK, TIMOTHY WEBB, DEREK ZISKA, Sandia National Laboratories, NICHELLE BENNETT, National Security Technologies, LLC — The Sandia National Laboratories RITS accelerator presently drives a self-magnetic pinch diode (SMP) that generates small electron beam spots. The diode's anode, 5 cm in diameter, is made of high Z metal in order to produce copious and energetic flash x-rays for radiographic imaging of high areal density objects. A number of cathode sizes, A-K gap lengths, anode target x-ray converter designs, and cleaning techniques are being implemented. The focusing of the electron beam on the target is accomplished by the space charge neutralization of the electron beam. The larger diameter target compared to the A-K length and cathode diameter, the plasma formed near the surface of the anode, and the counter-streaming ions emitted by the anode plasma and accelerated into the A-K gap, all contribute to that effect. We are currently measuring the back-streaming ion currents emitted from the various design anodes propagating through the hollow cathode tip, and we evaluate the A-K gap voltage by energy filtering techniques.

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