

Abstract Submitted  
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**Electron Beam Transport in Gas and Plasma-filled Cells for Radiography**<sup>1</sup> KELLY HAHN, Sandia National Laboratories, DALE WELCH, Voss Scientific, EDL SCHAMILOGLU, University of New Mexico, SAL PORTILLO, MARK JOHNSTON, BRYAN OLIVER, JOHN MAENCHEN, Sandia National Laboratories — In flash x-ray radiography, the paraxial diode utilizes a gas-filled transport cell to focus an electron beam into a small spot. In simulations, it has been shown that the primary limitation to achieving a small spot is due to time-dependent net currents in the transport cell which cause the beam's focal position to shift axially. This leads to a larger time-integrated spot than is desired. Further simulations suggest that replacing the gas with a preionized plasma significantly slows down the net current growth in the transport cell, thereby achieving a smaller spot. Recent experiments have been performed on the RITS-3 accelerator (4.5 MV, 70 ns). The basic physics principle of stabilizing the beam spot by incorporating a preionized plasma in the transport cell was demonstrated.

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