

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Spectroscopic Analysis of Electron Beam Diodes for Flash X-ray Radiography at Sandia National Laboratories* M.D. JOHNSTON, B.V. OLIVER, K. HAHN, D. ROVANG, J.E. MAENCHEN, Sandia National Laboratories, D. DROEMER, NSTec, D.R. WELCH, Voss Sci., Y. MARON, Weizmann Inst. of Science — Experiments were performed on RITS-3, a Marx driven, three stage IVA (5.5MV, 120kA), and are continuing on RITS-6, a six stage IVA (10MV, 120kA), to study the role of plasma formation and propagation on electron beam focusing for flash x-ray radiography. It is believed that plasmas formed on electrodes or by interactions with background gases limit e-beam focusing and stability and cause pulse shortening of the diode. These are concerns as higher doses (1000 Rad at 1m) from smaller sources (2mm dia.) are required for future radiographic applications. Diagnostics include time and space resolved visible and uv emission spectra using 1 meter Czerny-Turner monochromators equipped with framing and streak cameras. Line and continuum analysis are conducted using a time-dependent CR model. Self-consistent line shape calculations measure Stark, Doppler, and opacity broadening. Electron density and temperature determinations as well as neutral and ion species parameters are obtained. Such data is crucial to the fundamental understanding of electron beam diode behavior and aids in the continued development of these sources. *Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract DE-AC04-94-AL85000.

Mark Johnston

Date submitted: 26 Jul 2006

Electronic form version 1.4