

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Application of Optical Emission Diagnostics to Study Effects of Foils on Self Magnetic Pinch E-Beam Diode Operations. A.D. HEATHCOTE, A.D.J. CRITCHLEY, Atomic Weapons Establishment, M.D. JOHNSTON, Sandia National Laboratories — Optical diagnostics are being developed and deployed at AWE to explore the limiting physics of electron beam diodes used for flash x-ray radiography. Photodiode and imaging systems have been used to observe plasma emission from the diode anode cathode (A-K) gap during x-ray production (~ 100 ns) and for several microseconds beyond. There is currently a paucity of experimental data [1] direct from A-K gap plasmas; these data are needed to enhance understanding of the limiting physics of the diode geometries. Spatially and spectrally resolved intensity data from the A-K gap of self magnetic pinch (SMP) diodes has been collected and is presented. This has been used to study the role of foils used within the diode assembly and their role in inhibiting diode impedance collapse [2] for improved integrated dose output. [1] - Martin P, Short D, Jones A – Theory Underpinning Ongoing Fundamental Pinch Physics Research at AWE, November 2005 to August 2006. Ref: AWE/HD02/B/0607/812. [2] - I. Crotch et al., “Self Magnetic Pinch Diode Experiments at AWE”, 14th IEEE Int. Pulsed Power Conf., 2003, pp. 507-509.

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Date submitted: 14 Sep 2007

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