

Abstract Submitted
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Study of the Initiation Phase of Thick, Metallic Liners at 1MA

SIMON BOTT, University of California San Diego, I.C. BLESENER, C.L. HOYT, P.A. GOURDAIN, J.B. GREENLY, D.A. HAMMER, B.R. KUSSE, Cornell University, J.P. CHITTENDEN, M. WEINWURM, Imperial College London, M.E. CUNEO, Sandia National Laboratories — We present a study investigating the initiation of plasma in solid, metallic liners where the liner thickness is large compared to the collisionless skin depth. The current pulse on the 1 MA, 100ns COBRA generator is comparable to the early stages of the current pulse on the Z generator, and studies in the low current regime may highlight details of the liner initiation pertinent to the MagLIF fusion scheme [1]. We present optical emission data from aluminum liners using gated imaging and streak photography, which show a dependence of onset of emission with the size of a small power-feed gap introduced at the cathode. We also show measurements of the B-field inside the liner, using miniature Bdot probes, which show a dependence on the liner diameter and thickness. These data will be compared to magneto-hydrodynamic simulations. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. Work at Cornell University is supported by the NNSA-SSAA through Cooperative Agreement DE-FC03-02NA00057.

[1] Slutz et al, Phys Plasmas, 17, 056303 (2010)

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