Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Azimuthal Current Density Distribution Resulting from a Power Feed Vacuum Gap in Metallic Liner Experiments at 1 MA SIMON BOTT-SUZUKI, S.W. CORDARO, L.S. CABALLERO BENDIXSEN, University of California - San Diego, La Jolla, CA, USA, L. ATOYAN, T. BYVANK, W. POTTER, B.R. KUSSE, J.B. GREENLY, D.A. HAMMER, Cornell University, Ithaca, NY 14850, USA, J.P. CHITTENDEN, Imperial College London, London, UK, C.A. JENNINGS, Sandia National Laboratories, Albuquerque, NM, USA — 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. A vacuum gap is introduced in the power feed and we investigate the effect of this on the azimuthal initiation of plasma in the liner. We present optical emission data from aluminum liners on the 1 MA, 100ns COBRA generator. We use radial and axial gated imaging and streak photography, which show a dependence of onset of emission with the size of a small power-feed vacuum gap. The evolution of "hot-spots" generated from breakdown vacuum gap evolves relatively slowly and azimuthal uniformity is not observed on the experimental time-scale. We also show measurements of the B-field both outside and inside the liner, using miniature Bdot probes, which show a dependence on the liner diameter and thickness, and a correlation to the details of the breakdown. These data will be compared to magneto-hydrodynamic simulations to infer how such non-uniformities may affect full liner implosion experiments.

S.C. Bott-Suzuki
Univ of California - San Diego

Date submitted: 24 Jul 2015 Electronic form version 1.4