Abstract Submitted
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Double cathode experiments using radial foil configurations on the COBRA generator[1] B.H. PANG, A.Y. GORENSTEIN, J.E. KIM, P.-A. GOURDAIN, D.A. HAMMER, B.R. KUSSE, Cornell University — As part of the Laboratory of Plasma Studies at Cornell University, our research group has been investigating the dynamics and the collision of plasma bubbles formed by the explosion of metallic foils. A 100-ns rise time 1MA current runs through an aluminum foil, five micron thick, stretched horizontally onto the anode of the COBRA pulsed power generator. Cathode contacts consist of two hollow stainless pins equally spaced about the center of the foil. The parameters of this experiment include the spacing (3 mm) and inclination of the cathode pins (parallel or at a 45 degree angle). During the explosion, plasma bubbles are formed around each pin. As the bubbles grow and collide, interesting features appear in both experiments. For the parallel cathode configuration, a plasma plume forms above the center between the two bubbles before collision occurs. The plume resembles a twisted helix. For the slanted cathode configuration a plasma sheet forms when the two bubbles collide, and possibly a shock front is formed after the collision. The sheet extends inside a vertical plane just above the foil geometrical center. The electron density of this plasma sheet is approximately $5\text{x}10^{18}$ cm^{-3}, and its velocity is below 150 km/s.

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