Abstract Submitted
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Characterization of a Plasma Opening Switch Source by Interferometry and Probe Measurements A.G. LYNN, W. CLARK, D.P. JACKSON, M.A. GILMORE, University of New Mexico, M.E. SAVAGE, R.A. SHARPE, Sandia National Laboratories — The Triggered Plasma Opening Switch (TPOS) at SNL is a unique device that exploits the high conductivity and low mass properties of plasma. The TPOS's objective is to take an initial ∼0.8MA (∼250ns rise time) storage inductor current and deliver ∼0.5MA at ∼2.4MV (∼10ns rise time) to a load of ∼5-10Ω. Configuration advantages include low current jitter and resistive voltage drop, power gain, and minimization of trigger input power as the result of using two stages in series. This two-stage design is novel and is the first to demonstrate operation of magnetically triggered stages. Study of TPOS characteristics is in progress via an offline interferometer diagnostic; specifically, a CO_2laser interferometer will be used to make density measurements of the source plasma. It is thought that the gross plasma source density is $\sim 10^{14}$ cm^{-3}, but details of the spatial structure and temporal evolution have not previously been studied. In order to better understand switch operation, these details are essential. A double-tip Langmuir probe will also be used to provide an independent measure of plasma density and electron temperature. Current results from the interferometer using a single radial chord will be presented, along with multi-point radial measurements from the Langmuir probe.

A. G. Lynn
University of New Mexico

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