Abstract Submitted
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Intense relativistic electron beam-plasma interactions and parameter estimation[1] M.A. JAWORSKI, K.A. SCHULTZ, M.E. SCHULZE, LANL — Intense relativistic electron beam (IREB) propagation through plasmas is a common phenomenon with a range of applications from astrophysical gamma ray bursts, to inertial confinement fusion, to electron beam welding. Previous work indicates that IREB energy transfer transitions from collision-dominated processes at near-solid density, to a regime where plasma collective effects play a significant role[1]. In our experiments, we produce a plasma via isochoric heating of a thin, solid, high-Z target with an IREB. A simple expansion model is used to develop order-of-magnitude estimates for plasma parameters and evaluate instability growth rates within this plasma. Prototypical experiments on a molybdenum foil utilize visible imaging to characterize the plume and indicates nearly constant velocity expansion of several [mm/μs]. These measurements are an initial exploration of IREB transport in the transition from collision-dominated to collective-effects dominated phenomena. [1] C. Deutsch, *et al.*, *Phys. Rev. Lett.* **77** (1996) 2483.

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Michael Jaworski
Los Alamos National Laboratory

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