Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Laboratory Experimental Design of Molecular Cloud Implosions
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— The interaction of ionizing radiation with its surrounding medium is a ubiquitous issue in astrophysics. Although the interaction can occur in many environments, the interaction of an ionization front with a molecular cloud is of particular interest. Material ablated form the cloud can form turbulent structure [Peters *et al*, 2008] and coupled with the radiatively-driven implosion of the cloud can have important consequences in stellar formation. Our understanding of stellar formation is based on computer simulations and models. To improve our understanding of these models, data is required. We present the design of an experiment to study the interaction of an ionization front with a high density sphere, which acts as a surrogate for the molecular cloud. Irradiating a high-Z foil with laser beams generates the ionization front. The ionization front will propagate in a low density medium before interacting with the sphere. We will present our experimental design along with initial simulations. This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-FG52-09NA29548.

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Date submitted: 18 Jul 2012 Electronic form version 1.4