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Experimental design to understand the interaction of stellar radiation with molecular clouds ROBERT VANDERVORT, JOSH DAVIS, MATT TRANTHAM, SALLEE KLEIN, University of Michigan, YECHIEL FRANK, EREZ RAICHER, MOSHE FRAENKEL, Soreq Research Center, DOV SHVARTS, PAUL KEITER, R PAUL DRAKE, University of Michigan — Enhanced star formation triggered by local O and B type stars is an astrophysical problem of interest. O and B type stars are massive, hot stars that emit an enormous amount of radiation. This radiation acts to either compress or blow apart clumps of gas in the interstellar media. For example, in the optically thick limit, when the x-ray radiation in the gas clump has a short mean free path length the x-ray radiation is absorbed near the clump edge and compresses the clump. In the optically thin limit, when the mean free path is long, the radiation is absorbed throughout acting to heat the clump. This heating explodes the gas clump. Careful selection of parameters, such as foam density or source temperature, allow the experimental platform to access different hydrodynamic regimes. The stellar radiation source is mimicked by a laser irradiated thin gold foil. This will provide a source of thermal x-rays (around ˜100 eV). The gas clump is mimicked by a low-density foam around 0.12 g/cc. Simulations were done using radiation hydrodynamics codes to tune the experimental parameters. The experiment will be carried out at the Omega laser facility on OMEGA 60. Funding acknowledgements: This work is funded by the U.S. DOE, through the NNSA-DS and SC-OFES Joint Program in HEDPLP, grant No. DE-NA0001840, and the NLUF Program, grant No. DE-NA0000850, and through LLE, University of Rochester by the NNSA/OICF under Agreement No. DE-FC52-08NA28302.

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