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Initial experiments to understand the interaction of stellar radiation with molecular clouds ROBERT VANDERVORT, JOSH DAVIS, MATT TRANTHAM, SALLEE KLEIN, University of Michigan, DOV SHVARTS, University of Michigan; NRCN, 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 gas clumps in the interstellar media. For example, in the optically thick limit, when the radiation in the gas clump has a short mean free path, 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. 2D CRASH simulations guide our parameter selection. A stellar radiation source is mimicked by a laser-irradiated, thin, gold foil, providing a source of thermal x-rays around 100 eV. The gas clump is mimicked by low-density CRF foam. We plan to show the preliminary experimental results of this platform in the optically thick limit, from experiments scheduled in August. This work is funded by the U.S. DOE, through the NNSA-DS and SC-OFES Joint Program in HEDPLP, grant No. DE-NA0002956, and the NLUF Program, grant No. DE-NA0002719, and through LLE, University of Rochester by the NNSA/OICF under Cooperative Agreement No. DE-NA0001944. This work is funded by the Lawrence Livermore National Laboratory under subcontract B614207.

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