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Laser-driven heat-front propagation in foam vs. gas[1] F. PÉREZ, J.D. COLVIN, M.J. MAY, S.A. GAMMON, K.B. FOURNIER, Lawrence Livermore National Laboratory — A high-energy laser (several kJ, 10^{15} W/cm^2) can propagate inside an underdense plasma over millimeters, along its associated heat front. This creates a large volume of hot plasma (several keV) able to produce bright hard-x-ray sources when a high-Z dopant is included in the material. In the past years, we investigated the behavior of both gases and foams under these circumstances. Their design and predictability relies on the understanding of the heat front propagation. In the case of foams, several studies tried to assess the effect of their micro-structure in altering the laser interaction and the heat front propagation, but no experimental data has shown clear evidence. We present here the design and results of a recent experiment, using the OMEGA laser, where a Ge-doped silica foam was compared to a Ne/Kr gas of very similar characteristics, the only difference between these two materials being their micro-structure to allow for a straightforward determination of its influence. The design of future similar experiments will also be reported. J. Colvin presents theoretical and modeling aspects of this subject in a companion presentation.

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