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Shock wave formation induced by the supersonic-to-subsonic transition of radiation transport in silica aerogel[1] ROBERTO COLON QUINONES, DEAN RUSBY, FELICIE ALBERT, KLAUS WIDMANN, STEPHEN MURRAY, SHON PRISBREY, Lawrence Livermore National Laboratory — We are developing a platform that can measure via radiography the interaction of strong and weak shocks. Our first step is to show that we can produce weak shocks via the absorption of radiation as it transitions from supersonic to subsonic transport within a medium. We present the results of an experiment carried out at the Omega laser facility intended to study the supersonic-to-subsonic transition of radiation in low density (32 mg/cc) silica (SiO_2) aerogel. The target package was comprised of a silica foam cylinder which was driven by a $\sim$115 eV radiation drive created by a laser-driven halfraum. The drive induced a supersonic radiation front that propagated axially into the cylinder. X-ray radiography showed the creation of a density perturbation in the middle of the silica, consistent with the transition of supersonic-to-subsonic radiation transport. These results will be used to prepare for a future Omega experiment where we will study the interaction of such a shockwave with a strong shock induced through direct laser ablation, replicating a phenomena frequently observed in high-energy-density experiments. The goal of this campaign is to demonstrate that the described shock wave interaction can be accurately simulated with the radiation hydrodynamic code KULL.

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