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Author(s): Benage, John F.
Taccetti, Jose M.
Luo, Shengnian
Falk, Katerina
Lanier, Nicholas E.
Schmidt, Derek W.
Crockett, Scott
Fryer, Christopher L.

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Temperature measurements along the principal Hugoniot for 0.2 g/cc aerogel foam.

J.F. Benage, M. Taccetti, S. Luo, N. Lanier, K. Falk, D.W. Schmidt, S. Crockett, C. Fryer, Los Alamos National Laboratory.

Aerogel (SiO₂) foams are used in a variety of HED experiments such as radiation flow experiments and more recently as a low-density shock standard for WDM equation of state experiments. Many of these experiments can be sensitive to the EOS of the foam. Despite recent very successful Hugoniot measurements of 0.2 g/cc aerogel foam, the temperature of these foams at a given pressure has not been measured and many EOS models ignore important physics, thus predicting very different temperatures for a given condition. We have completed a set of temperature measurements of 0.2 g/cc aerogel foam shocked along the principal Hugoniot from 100-400 GPa. The experiments were done using 12 beams at the Omega laser facility to launch strong steady shocks into the foam targets. The temperature of the shocked foam was determined from measurements using the streaked optical pyrometer (SOP). The range of pressures covered established the behavior of the temperature through the important dissociation and initial ionization range. Equation of state models, where available, are compared to the data.