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Reflectivity loss in shock front velocimetry[1] P.M. CELLIERS, Lawrence Livermore National Laboratory, T.R. BOEHLY, University of Rochester Laboratory for Laser Energetics, C.A. THOMAS, H.F. ROBEY, S.A. MACLAREN, H.-S. PARK, M.B. SCHNEIDER, K. WIDMANN, G.W. COLLINS, O.L. LANDEN, Lawrence Livermore National Laboratory — Velocity interferometry has become an established tool for studying shock timing and drive characterization on NIF ignition scale capsules. The technique is viable as long as a reflection can be captured from the shock front in the sample. Experiments in liquid deuterium are able to track shock fronts up to about 150 km/s velocity beyond which the reflection is extinguished. The reflectivity can be extinguished through a variety of mechanisms most of which involve some form of photoionization of the sample material along the line of sight. Analysis of the case of liquid deuterium suggests that the reflectivity loss is caused by self-emission of radiation from the shock front. Details of this analysis will be described and extended to other cases such as quartz and fused silica to estimate the onset of reflectivity loss in the strong shock limit.

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