

LIMITATIONS ON THE RECONSTRUCTION OF MACH REGION FLOW FIELDS FROM SELECTED OVERPRESSURE OBSERVATIONS

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A method of reconstructing a blast wave flow field from selected overpressure observations versus time has been developed by Celmins of the Ballistic Research Laboratory. Although the method was derived assuming spherically symmetric flow, it has been applied with success at moderate to low shock overpressures in the Mach region of height-of-burst experiments at the Defense Research Establishment Suffield, Alberta, Canada, and at selected distances on PRE DIRECT COURSE and DIRECT COURSE events at White Sands Missile Range, New Mexico. In this paper the range of applicability of the method in the Mach region versus HOB is examined. The output of hydrocode computations for scaled HOB of 61, 122, and 213 m is used to provide input overpressure waveforms for the method. The range of applicability is determined by the accuracy with which the dynamic pressure waveforms are duplicated. The results provide guidance in applying the method to past experimental data and in planning experiments where the method is to be used to define dynamic pressure, particle velocity or density from overpressure observations.