

DUST LADEN BLAST ENVIRONMENTS IN SHOCK TUBES

NEWELL,R.T.

Airblast environments which occur near the ground surface as a result of detonation of nuclear weapons often contain significant amounts of dust particles which can influence the blast loading of structures. The nuclear weapons effects community is interested in both the simulation and measurement of such environments in order to better understand and quantify the effects of dust laden airblast on structures of interest.

Shock tubes are important tools for simulation of scaled nuclear airblast environments. They have been used to generate dust laden airblast by introduction of dust particles into the airblast flow by various means. This paper describes some tests of this type which were conducted in the 6-ft-diameter by 240-ft-long shock tube at the Weapons Laboratory at Kirtland Air Force Base, New Mexico. The test results are analyzed through the use of the NMERI GenUninely Simple Hydrocode (GUSH) program, which is a two-dimensional, two-phase, Eulerian, finite difference computer code for fluid dynamic modeling. The code is also used to predict dust laden blast environments for suggested shock tube tests which have longer duration and more spatially uniform particle flows than previous tests.