GROUND-SHOCK ENHANCEMENT USING MULTIPLE EXPLOSIVE CHARGES

M. A. Groethe, J. K. Gran
SRI International, 333 Ravenswood Ave., Menlo Park, California, USA

Three laboratory-scale experiments were performed in rock to measure the groundshock particle velocity field produced by a single spherical charge, from an array of nineteen spherical charges, and from a single spherical charge equivalent in mass to the 19-charge array. Test articles were machined from Salem limestone with cavities for the high explosive and sensor arrays. Particle velocity from the single spherical charge tests were measured with velocity loops and accelerometers. The particle velocity for the 19-charge array was derived from accelerometer measurements. The 19-charge array produced a clear enhancement of particle velocity and displacement over a single charge of the same mass.

Introduction

Multiple explosive charge arrays have been considered as a technique for extending ground-shock levels in a geologic medium. Numerical simulations have suggested that the enhancement at certain ranges can be quite large. To date there has been little experimental evidence to test the numerical models. These experiments were designed to provide high quality data in the form of particle velocity and displacement measurements from close to an explosive source and extending into the range where ground-shock enhancement from multiple charges has been predicted to occur.