

BLAST PROPAGATION TO 1000M FROM SMALL HE CHARGES

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Using unconfined 1 kg charges of HE as the source, the blast waveform and its associated parameters have been measured at distances of up to 1000m for propagation over grass. Upwind of the sources provided that the geometry is such that the receiver is in the shadow zone., all of the high frequency content is removed and the waveform is dominated by its low frequency content. The overpressure, however, is not much less than it would be in the downwind direction. Downwind, the waveform is greatly affected by the nature of the ground over which it travels and by the geometry of the source and receiver relative to that ground. In general the waveform consists of an initial sharp spike followed of low frequency cycle. This is thought to be the result of high-frequency phase-reversal occurring in that component of the wave which is reflected from the ground. The superposition of the two high frequencies expect tight at the beginning when the direct component arrives just prior to the reflected component.

At distance in excess of 100m from the 1kg source, the overpressure is such that the behavior of the wave is almost linear. Linear theory has therefore been used to try to predict the downwind waveforms using a previously measured free-air waveform and the measured acoustic impedance of the ground. Remarkably good agreement is achieved between predicted and measured waveforms both in terms of shape and peak pressure. Although the scaling laws cannot be applied simply it is possible to make meaningful predictions using relatively straightforward mathematics.