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Source Spectral Variation and Yield Estimation Derived from High Frequency P and S Codas from Local High Frequency Explosion Data

We report on two near-source explosion data sets to better understand the generation and properties of the scattered P and S wavefields. In the first case, we look at tamped single-fired explosions (~130-270 lbs) shot in Barre granite from the New England Damage Experiment (NEDE) using high-frequency 3-component stations ranging from ground zero to 15 km distance for a variety of explosives that have various velocities of detonations. In the second case, we look at 10 explosions of 1450 lbs that were shot at a range of depths of burial (DOB) and heights of burst (HOB) from the Humble-Redwood series of explosions in alluvium at Albuquerque, NM. These well-instrumented experiments provide us with excellent data from which to document the spectral shape, relative partitioning between P and S-waves, and amplitude/yield dependence. We also consider two methods of obtaining the coda-derived source spectra and compare these results. The first method uses a modified Mueller-Murphy source model derived from spectral ratios and the second uses a more traditional coda calibration procedure outlined in Mayeda et al. (2003).

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