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# Determination of Body-wave Magnitudes of the North Korean Underground Nuclear Tests

We determined teleseismic short-period body wave magnitude (mb) for the six underground nuclear explosions (UNE) at the North Korean test site by using globally distributed seismographic stations in the epicentral distance range of 30° to 95°. Most of the stations selected for the magnitude determination are located in central Asia, Europe, Australia, and North America, but none from South America and Africa. Data from about 40 common stations that recorded most of the six explosions are used to simulate the analog World-Wide Standardized Seismograph Network (WWSSN) records in an attempt to utilize conventional mb and yield relations developed during WWSSN era – early 1960s through mid-1980s, for the UNEs at similar site conditions. We also determined root mean square (RMS) amplitudes of Lg waves from the six known North Korean UNEs by using waveform data from seismic stations situated on continental crustal paths from the UNEs. Six stations in Asia produced useful data. The RMS Lg amplitude measurements show consistency between the stations with comparable propagation paths. The RMS Lg amplitudes correlate well with mb and suggest that the RMS Lg amplitudes can be useful to estimate the yield of the six North Koran nuclear tests.

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