

Absolute and Relative Body Wave Magnitudes of Five DPRK Events as Measured by the IDC

The International Data Centre (IDC) determines various types of seismic magnitudes. Estimation of body wave magnitude mb is based on P-waves measured at stations of the International Monitoring System (IMS). Because of the CTBT-related monitoring requirements signal amplitude and corresponding period are measured within a 6 s window, including 5.5 s after arrival time. This is approximately the same time widow as used in the waveform cross-correlation (WCC) method, which is under development at the IDC. The WCC method is applicable only to spatially close events generating similar signals as observed at IMS stations. We proposed to use the ratio of RMS amplitudes in cross-correlation windows for relative magnitude estimation of two close events. Five DPRK tests were conducted within a few km from each other and represent an important case for relative magnitude estimation and comparison with the network mb estimates. Stations of the IMS seismic network are well distributed over azimuth and take-off angles for the DPRK test site. Thus, the ratios of RMS amplitudes are tested for the use in the relative moment tensor inversion.

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