



Repeating events in North China recorded by the Beijing Capital Digital Seismograph Network

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Repeating events occupy a significant ratio of earthquake activity in China. Using the data of GSN, Schaff and Richards (2004) found that in China about 10% of earthquakes were repeating events. When looking at regional/local recordings, such a ratio has a significant increase. Taking the definition of waveform correlation by Schaff and Richards (2004), we cross-correlated the BB/VBB and/or SP waveforms recorded by the Beijing Capital Seismograph Network from 2002 to 2006. BB/VBB waveforms were pre-filtered by a 0.5 to 5.0 Hz band-pass filter, and SP waveforms were pre-filtered with a 1.0 to 5.0 Hz frequency band. There are 3,567 event pairs picked, being 24% of the whole events. The repeating events includes doublets, triplets, $\dot{}$ -, and n-plets where n is up to 135. In contrast, in the GSN data of Schaff and Richards (2004), n is up to 26. Assuming that the repeating events are separated by no more than 1 km, the network-measured apparent distance X of 'event pairs' indicates the order of magnitudes of the location error, and the difference of travel time readings between the 'event pairs' indicates the error of phase picking, seismological monitoring capability can be evaluated by examining the distribution of X. It is observed that the average accuracy of the routine location result of the Beijing Capital Digital Seismograph Network is of the order of magnitudes of 5 km in the northern part where seismic observational condition is better, and of 13 km in the south and west part where seismic observational condition is to be improved. In any case it is necessary to conduct accurate locations based on new algorithms and better structure models.