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application of multi-criteria synthetic method in discrimination of nuclear explosions from earthquakes

Doubtful earthquake events in Standard Screened Event Bulletin of International Data Center are focus events to every signatories. For this demand, complexity of waveform, spectral ratio, and composite ratio were selected as the three criteria for discrimination of nuclear explosions from earthquakes by the difference between their focal mechanisms, and research of multi-criteria synthetic method has been developed. The three criteria and multi-criteria synthetic method were applied to six nuclear explosions and five natural earthquakes, which happened in Punggye-ri nuclear test site of North Korea. The results of application indicated that multi-criteria synthetic method came to an accurate conclusion for these events, even if one of the criteria provided a wrong decision, which verified the effectiveness of multi-criteria synthetic method.

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