Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

SSS28-P14 会場:コンベンションホール 時間:5 月 23 日 18:15-19:30

近地・遠地波形を用いた地震波エネルギーの推定
Estimation of Radiated Seismic Energy from Regional and Teleseismic Waveforms

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Radiated seismic energy from the seismic sources is a fundamental parameter for understanding source physics, but it has a large uncertainty. Therefore, it is important to compare different methods for estimating the radiated energy. Especially, we are interested in studying the apparent stress (rigidity multiplied by the ratio between radiated energy and seismic moment) of strike-slip earthquakes in the oceanic lithosphere, because it is often high (Choy and McGarr, 2002). However, this result is obtained from teleseismic P waves, and it is often difficult to correct for the radiation pattern of nodal arrivals, therefore, the estimated apparent stress may have a large variations.

In this study, we estimated the radiated energy for two large strike-slip earthquakes in Japan, the 2000 western Tottori earthquake (Mw 6.7) and the 2005 West off Fukuoka Prefecture earthquake (Mw 6.6), using both regional (less than 100km) and teleseismic (30deg < delta < 90deg) waveforms. To estimate the energy correctly, it is necessary to account for source effects (e.g.,radiation pattern) and path effects (e.g.,attenuation). We use only P waves for the teleseismic waveform, because of the strong attenuaion of teleseismic S waves and interference with other phases. For the teleseismic waveforms we need to account not only direct P but also depth phase, pP and sP (Boatwright and Choy, 1986).

The results show that the radiated energy of two earthquakes are not high. We will examine the each data carefully, and evaluate the differences in results from the different teleseismic and locally recorded data.

キーワード: 地震波エネルギー, 見かけ応力, 横ずれ型地震
Keywords: radiated energy, apparent stress, strike-slip earthquake