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地震波・地震音波データ同化による 2008 年岩手・宮城内陸地震の断層パラメータ推定
Fault parameters inferred from data assimilation on seismic & acoustic waves due to 2008 Iwate-Miyagi Nairiku Earthquake

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An evidence of seismoacoustic waves due to a big earthquake is sometimes recorded in barometer data at an infrasound observatory several hundred kilometers away from the hypocenter. Such infrasound variations must contain information of the source mechanism of the earthquake and structures of both solid Earth and atmosphere. Therefore it is possible to obtain, from a different perspective from seismic data, knowledge about earthquakes by analyzing the infrasound data.

Here we estimated the fault parameters of the 2008 Iwate-Miyagi Nariku Earthquake carrying out data assimilation on infrasound data. First we calculated a set of eigenfunctions of normal modes (Kobayashi [2007]) related to a one-dimensional coupled model consisting of the solid Earth (PREM; Dziewonski and Anderson [1981]) and the atmosphere (NRLMSISE-00; Picone et al. [2002]). Then we constructed prior distributions for the fault parameters such as rupture length and velocity by integrating models previously proposed from many universities and institutes. Finally we applied a sequential Monte Carlo (SMC) method such as the particle filter algorithm to a combination of simulated waves derived from the eigenfunctions and observed data obtained at CTBTO Isumi microbarometer array. We will discuss especially on the obtained posterior distributions of the fault parameters and differences between our result and the previous ones.

キーワード: データ同化, ベイジアンフィルタ, 粒子フィルタ, 微気圧, 地震音波, 岩手・宮城内陸地震
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