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# Fault Parameter Estimation from Coseismic Infrasound Variation Excited by a Large Earthquake

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We propose a procedure to estimate seismic parameters, e.g., moment magnitude and rupture velocity, from coseismic infrasound phenomena called "seismoacoustic waves" excited by large earthquakes. Assuming that seismoacousic waves are generated by successive several point sources, we simulate the waveforms as a convolution of the relevant seismic source mechanism and the Green's function constructed from normal modes of a coupled Earth's model that consists of the solid Earth and the atmosphere. Unknown parameters in a rupturing fault model are estimated through an inversion in order to explain real observed infrasound variations.

As an example, the proposed procedure is applied to infrasound variations associated with the Iwate-Miyagi Nairiku Earthquake that occurred in northeast Japan in June 2008. A posterior distribution for each model parameter, such as rupture velocity, scalar seismic moment, and time delay influenced by wind in the atmosphere, are determined by using a Monte Carlo algorithm through measuring fitness of the synthetic waveform to the observed infrasound variations in the periodic range >30 seconds. The obtained posterior distributions indicate that infrasound data could give a strong constraint on the focal depth in the cases of shallow earthquakes.