

Coseismic atmospheric and ionospheric variations detected at the Sugadaira Space Radio Observatory

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Recent improvements in sensor technology and expanding geophysical observation networks have clearly indicated evidence of oscillations in the atmosphere and ionosphere excited by earthquakes. Investigations of such coseismic phenomena recorded in non-seismic observations together with seismic records could clarify the dynamics between the solid Earth and atmosphere including the ionosphere. More infrasound observations would provide important information of activities of the Earth's crust, especially strong constraints on source mechanisms, and contribute eventually to an establishment of tsunami early warning system that rapidly evaluates preceding acoustic waves originated from approaching tsunamis although the number of infrasound observatories is insufficient at this moment.

In order to continuously monitor atmospheric and ionospheric phenomena related to activities of the Earth's crust, we have established an infrasound monitoring station at the Sugadaira Space Radio Observatory ($36^{\circ} 31.389'$ N, $138^{\circ} 19.073'$ E) of the University of Electro-Communications. This station is located at appropriate distances from both the aftershock region of the 2011 Off the Pacific Coast of Tohoku Earthquake and the supposed area of the forthcoming Tokai-Tonankai-Nankai Earthquake. We successfully detected infrasound variations excited by a few large aftershocks of the 2011 Off the Pacific Coast of Tohoku Earthquake, and reproduced the observed waveforms by using a normal mode summation technique, in which a one-dimensional Earth's structure model consisting of PREM for the solid Earth and NRLMSISE-00 for the atmosphere is assumed.