

Multi-site infrasound observation around Syowa station, Antarctica

KAKINAMI, Yoshihiro^{1*}; OKADA, Kazumi⁶; YAMAMOTO, Masa-yuki¹; KANAO, Masaki²; MURAYAMA, Takahiko³; MATSUSHIMA, Takeshi⁴; ISHIHARA, Yoshiaki⁵

¹Kochi University of Technology, ²National Institute of Polar Research, ³Japan Weather Association, ⁴Institute of Seismology and Volcanology, Faculty of Sciences, Kyushu University, ⁵JAXA Space Exploration Center, Japan Aerospace Exploration Agency, ⁶Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University

Infrasound is one of the frontier fields in geophysics to observe atmospheric events. World wide infrasound observing network has been constructed as the CTBTO (Comprehensive Nuclear-Test-Ban Treaty Organization) to detect infrasound signal from huge artificial explosions, however, the CTBTO infrasound observing stations usually catch the natural infrasonic waves generated by many geophysical events, like volcanic eruptions, earthquakes, tsunamis, etc. For example, when a huge meteorite fall was observed near Chelyabinsk, Russia in 2012, the induced infrasonic waves reached to many distant CTBTO stations more than 10,000 km apart from. In the polar region, there exists local infrasound sources generated mainly by the ice sheets on ground, ice field, and glacier motions. Icequakes have been frequently monitored by seismic stations in polar region, however, monitoring of induced atmospheric infrasonic waves through lithosphere-atmosphere coupling is still in progress. We installed an infrasound sensor at Syowa station, Antarctica in 2008 during IPY (International Polar Year) period by JARE (Japanese Antarctic Research Expedition) 49 mission. However, the direction-finding of the infrasonic waves is significant to study the comparison between the seismic data, thus, 2 sensors were added on Syowa to make a triangle sensor array in 2013 by JARE 54. In addition, 5 more sensors were installed at 5 locations around Syowa in 2013 (Murayama et al., 2013).

The infrasound data observed at Syowa can be transferred to Japan via satellite connection, however, the data recorded by data logger at the stations near Syowa cannot be obtained without visiting there. In JARE 55 mission, we obtained one-year infrasound observation data recorded at several stations around Syowa and will return them back to Japan in March 2014. In this paper, we will introduce some preliminary results obtained in Antarctica as the first multi-site infrasound observation at the frozen continent.

Keywords: ifrasound, Antarctica, multi-site observation, JARE, ice quake