Seismic and infrasound observations at Syowa Station and surrounding region of Antarctica - Sciece targets and data management for long-term monitoring -

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Seismic observations at Syowa Station (SYO), East Antarctica started since 1967 on the era of the International Geophysical Year (1957-1958). Based on the development of telecommunication links between Antarctica, digital data have been transmitted to the National Institute of Polar Research (NIPR) for the main purpose of phase identification of the teleseismic events. Arrival times of the detected phases have been reported to the International Seismological Centre (ISC), and published as the "JARE Data Reports" from NIPR. Recorded teleseismic and local seismic signals have sufficient quality for conducting many kinds of research analyses in terms of dynamics and structure of the Earth's as viewed from Antarctica. In particular, a long-term detection of teleseismic events, as well as characteristic local cryoseismic signals have been especially demonstrated associated with surface variations in the Antarctic Plate and continental margins of the continent. In contrast, infrasound observation at SYO started since 2008 by using a single sensor, as a part of the International Polar Year (IPY2007-2008) program. In austral summer in 2013, moreover, three-sensor arrayed observations at SYO together with several field stations were established along the coast of the bay. By using these recorded data, a long-term trend of infrasound signals have been continuously monitored until moment. Characteristic infrasound waves represent physical interaction involving environmental changes near surface layers of the Earth, including ice sheet, sea ice and icebergs and ocean. Continuous recording of infrasound over the last few years clearly indicate a background atmospheric vibration caused by ocean-atmosphere interaction (microbaroms). Because larger amount of sea-ice extending around the bay near SYO suppress oceanic swells, the microbaroms amplitudes become weak during austral winter. SYO array clearly detected the propagating directions and frequency contents of the microbaroms. In addition, by combining the other deployed array on continental ice sheet, a significant number of characteristic signals (discharge of sea-ice, icebergs, calving events of ice sheet, etc.) have been detected as resultant events caused by surface environmental variations. In this presentation, scientific targets, recent achievements and data management for both seismic and infrasound observations will be presented, in particular focused on the area nearby SYO conducted by JARE.