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Detection Capability of Teleseismic Events Recorded at Syowa Station, Antarctica: 1987-2007

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Phase identifying procedure for the teleseismic events at Syowa Station (69.0S, 39.6E), Antarctica have been carried out since 1967 by use of analog and digital records of the short- and the long-period seismometers. After the establishment of INTELSAT telecommunication link, several kind of digital data have been transmitted to the National Institute of Polar Research (NIPR) for the utilization of the seismic phase identification. The arrival times of several phases, such as P, PKP, PP, S, SKS have been reported to United States Geological Survey (USGS) and International Seismological Center (ISC), then published as the JARE Data Reports (Seismology). In this paper, hypocentral distribution and time variations for the detected earthquakes by monitoring observation at Syowa Station was studied in the 21 year period from 1987 to 2007 by using the published Data Reports. The epicentral parameters were investigated in terms of focal depth dependency and seasonal trending in the threshold range of detectable magnitude. Moreover, detection capability of teleseismic events in the southern hemisphere was discussed in comparison with the global results derived from ISC data. From GAMSEIS data obtained in 2008-09, local and regional seismic signals associated with ice sheet movement and meteorological variations were recorded; together with significant number of teleseismic events. The detection of seismic signals from phenomenon at the base of the ice sheet, such as outburst floods from subglacial lakes could be expected from detailed analyses. In this presentation, in addition to the study of the Earth's deep interior, super-continent, several remarkable detected signals are demonstrated involving global warming.

Keywords: Syowa Station, teleseismic events, detection capability, monitoring observation, global network