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Evaluation of Long-Period Detectability of Teleseismic Events at Syowa Station, Antarctica

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ABSTRACT

Phase identification procedures for teleseismic events at Syowa Station (69.0° S, 39.6° E; SYO), East Antarctica have been carried out since 1967 after the International Geophysical Year (IGY; 1957-1958). Since the development of INTELSAT telecommunication link, digital waveform data have been transmitted to the National Institute of Polar Research (NIPR) for the utilization of phase identification. Arrival times of teleseismic phases, P, PKP, PP, S, SKS have been detected manually and reported to the International Seismological Centre (ISC), and published by "JARE Data Reports" from NIPR. In this paper, hypocentral distribution and time variations for detected earthquakes are demonstrated over the last four decades in 1967-2010. Characteristics of detected events, magnitude dependency, spatial distributions, seasonal variations, together with classification by focal depth are investigated. Besides the natural increase in the occurrence of teleseismic events on the globe, a technical advance in the observing system and station infrastructure, as well as the improvement of procedures for reading seismic phases, could all combine to produce the increase in detection of events in last few decades. Variations in teleseismic detectability for longer terms may be possible by association with the meteorological environment and seaice spreading area around the Antarctic continent. Recorded teleseismic and local seismic signals have sufficient quality for many analyses on dynamics and structure of the Earth as viewed from Antarctica. The continuously recorded data are applied not only to lithospheric studies but also to the Earth's deep interiors, as a significant contribution to the Federation of Digital Seismological Networks (FDSN) from high southern latitude.

KEYWORDS

Teleseismic Events; Detectability; Syowa Station; Antarctica; Global Network

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