

## Developing Plans for Antarctic Seismic Deployments: Antarctic Arrays in International Polar Year

# Masaki Kanao[1]; Seiji Tsuboi[2]; Satoru Tanaka[3]; Muneyoshi Furumoto[4]; Ichiro Nakanishi[5]

[1] NIPR; [2] IFREE; [3] IFREE/JAMSTEC; [4] Grad. School Environ., Nagoya Univ.; [5] Dept. Geophys., Kyoto Univ.

<http://polaris.isc.nipr.ac.jp/~pseis/>

Existing seismic stations allows resolution of the structure beneath Antarctic continent at a horizontal scale of 1000 km, which is sufficient to detect fundamental differences in the lithosphere beneath East-West Antarctica, but not to clearly define the structure within each sector. In addition, seismicity around the Antarctic is limited by the sparse station distribution and the detection level for earthquakes remains inadequate for full evaluation of tectonic activity. Antarctic Arrays is an ambitious program to improve seismic instrumentation on and around the Antarctica. A science plan designed to improve the understanding of the Antarctic Plate with this Array Deployment is currently under development. This Antarctic Arrays strategy has several components, including 1) process-oriented experiments such as 3D-arrays at SPA; 2) evolving regional arrays; and 3) an enhanced permanent backbone network.

An outline of network and regional arrays follows. Backbone Network; Existing broadband stations of the Federation of Digital Seismographic Network should be supplemented by stations operating year-round with Global Seismological Network instrument specification. Technological advances in power supplies and real-time data transmission for remote stations, as well as significant logistical support, are required to implement such a network. Deployment of the backbone network would make a major contribution to Antarctic and global seismology, and would provide an essential framework for regional arrays. Evolving Regional Array; Deployments of portable broadband seismic stations with horizontal spacing of 200-300 km can delineate major tectonic boundaries beneath the vast ice-covered regions of the Antarctic continent. A strategy of attaining a sufficient density of stations (20-30 instruments) in symmetrically disposed sectors of the continent allows optimal ray path coverage across Antarctica and improves tomographic resolution. Two-three sectors could be deployed simultaneously for 1-2 seasons, then moved to adjacent sectors for the next deployment phase.

The broadband monitoring observations at several outcrops around the Lutzow-Holm Bay area can also contribute to the Antarctic Arrays program, as the stations in marginal part of Antarctic continent. In situation when some array deployments shall be carried out on Eastern Dronning Maud Land by using air-borne platform from SPA, we can make an effort to offer the ground support for the installation of additional stations. The obtained data-set at the IPY 2007-2008 can be initially stored and published for all the related cooperatives and the other geo-scientists by Internet service from the data library server of the National Institute of Polar Research (POLARIS system). Then immediately offered to the world data centres of seismology, such as IRIS/DMS, FDSN/GSN, PACIFIC21 centres. These web-pages can be opened in general and combined to the JCADM, SCAR/ANTEC, etc.