Marine geophysical monitoring observations under the Japanese Antarctic Research Expedition

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The Southern Indian Ocean is key area for understanding the fragmentation process of the Gondwana. Marine geophysical observations on board the ship provide fundamental information to elucidate the Gondwana breakup process and tectonic history of seafloor spreading in this region. However, tectonic history in the Southern Indian Ocean still remains less well-defined because of the sparse observations in this area. Japanese new Icebreaker Shirase has been put into operation in 2009. Main purpose of the ship is to transport the personnel and cargo to Japanese Antarctic Station, Syowa, once a year under the Japanese Antarctic Research Expedition. Swath bathymetric data by multi narrow beam echo sounding (Seabeam 3020 system), sub-bottom data by 3.5kHz sub-bottom profiler (BATHY-2010), shipborne gravity data by the LaCoste & Romberg Air-Sea Gravity System II, and shipborne vector geomagnetic data by the flux-gate type magnetometer have been obtained on her route mainly to understand the process of Gondwana fragmentation in the Indian Ocean. The ship also crosses the Southeast Indian Ridge, which forms the plate boundary between the Australian and Antarctic plates, every year almost along longitude of 110E and 150E. On the other hand, continuous observation by ocean bottom pressure gauge have been carried out since December 2004 to reveal current sea water mass change off Lützow-Holm Bay at 4500m depth (66°50'S, 37°50'E) in the Antarctic Divergence Zone, and those data are also used for the ground truth of satellite measurements.
We will introduce the present status of the marine geophysical data obtained by Icebreaker Shirase and the contibutions of those data to the international projects.