[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS13]Integrated Analysis of Geoscience Observations from the Floor to Surface of the Ocean

convener:Keisuke Ariyoshi(Japan Agency for Marine-Earth Science and Technology), Motoyuki Kido(International Research Institute for Disaster Science, Tohoku University), Daisuke Inazu(東京海洋大学, 共同), Narumi Takahashi(National Research Institute for Earth Science and Disaster Resilience)
Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Sea bottom pressure data contains various components such as crustal deformation, ocean oscillation, tidal variability, atmospheric change, and instrumental drift. So far, seismologists have treated the ocean oscillation as noise, and ocean physicists have done vice versa (considering crustal deformation as noise). Such problems apply to ongoing undersea acoustic distance measuring and other types of ocean observations. In this session, we welcome contribution on various topics focusing on the complementary relationship between seismology, ocean physics, meteorology, tsunami technology, and other related fields.

[MIS13-P03]Monitoring the deep western boundary current in the western North Pacific by echo intensity measured with LADCP

Kanae Komaki[1], *Akira Nagano[2] (1.University of Washington, 2.Japan Agency for Marine-Earth Science and Technology)
Keywords:LADCP echo intensity, Deep western boundary current, Lower circumpolar deep water

Formation of iron-manganese nodules is considered to be related to the lower circumpolar deep water (LCDW). The LCDW is transported by the deep western boundary current (DWBC) in the Pacific Ocean. Because the dissolved oxygen (DO) concentration of the LCDW is high, oxidation of iron and manganese irons is considered to be predominant in the DWBC. We assumed that by the faster removal of particulate iron hydroxide and manganese oxide, densities of the particulate matters are lower in the DWBC than the interior region. To detect the density variation of suspended particles between the DWBC and interior regions, we analyzed echo intensity (EI) measured in the western North Pacific with a 300 kHz lowered acoustic Doppler current profiler (LADCP) in a whole water column. At depths greater than 3000 m, EI is almost uniformly low between 12N and 30N but increases sharply from 30N to 35N, reaching a maximum north of 35N. In comparison with the background EI distribution, EI in the DWBC is found to be remarkably low. The DWBC pathways are identifiable by the low EI and high DO. This finding may be useful in various geoscience applications. For example, this method is applicable to seismology. The variations of the DWBC are associated with the bottom pressure variations and obscure seismic signals. LADCP EI data and other acoustic instruments may be used to observe the variations of the DWBC and to detect seismic signals.