[EE] Evening Poster | S (Solid Earth Sciences) | S-IT Science of the Earth's Interior & Tectonophysics

[S-IT24]Probing the Earth's interior with geophysical observation on seafloor

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Most important sites for plate tectonics and mantle dynamics studies (e.g., subduction zones, spreading ridges, and hot spots) are located in oceanic regions. The coverage of seismic stations is concentrated in land areas, which cover only one-third of Earth's surface. Since 1990s, technology for seafloor geophysical instruments to explore deep earth structure have been advanced, such as broadband ocean bottom seismographs (BBOBSs), ocean bottom electro-magnetometers (OBEMs), and pressure gauge, because observation network in oceanic regions is essential for major breakthroughs in Earth sciences. Technical advance in the instruments including cabled realtime seafloor networks have made the seafloor observation more common and reliable, which promotes a number of seafloor observations, both temporary and permanent networks, in the last decade. We call for papers on recent scientific results from such observation projects, including those on crust and mantle structure beneath subduction zones, hot spots, Large Igneous Provinces, and spreading ridges. Technical advances for observation in oceanic regions, including seafloor instruments and drifting float, proposals and plans for innovative observations are also welcome.

[SIT24-P04]Sedimentary structure and tectonic setting of the Lyra basin central-western Pacific Ocean

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Keywords:Ontong Java Plateau, multi-channel seismic reflection survey, Large Igneous Provinces

Ontong Java Plateau (OJP) is located north of Solomon Islands, central-western Pacific Ocean. The area of OJP is about 1.9×10^6 km^2. The main portion of the OJP formed rapidly about 120 Ma at mid-southern latitude in the Pacific Basin (Chandler et al., 2012). The OJP is surrounding by six abyssal basins, East Mariana, Pigafetta, Nauru, Ellice, Stewart, and Lyra basins. East Mariana, Pigafetta, and Nauru basins. East Mariana, Pigafetta, Nauru basins were formed at the Pacific-Izanagi and Pacific-Phoenix ridges, respectively (Nakanishi et al., 1992). The magmatic activity that formed Lyra basin is related to the magmatic activity of the OJP (Shimizu et al., 2015). However, the tectonic history of the Lyra basin is under debate. The tectonic history of Ellice and Stewart basins have also not been revealed yet. Owing to the unknown of tectonic histories of these three basins, tectonic setting of OJP is unclear whether OJP was formed at on ridges or off ridge. To expose the tectonic history of Ellice, Stewart, and Lyra basins, we conducted the multichannel seismic reflection(MCS) survey in the basins as well as the OJP during the research cruise MR14-06 Leg 1 by R/V Mirai. We present our preliminary results of the MCS survey in the Lyra basin.

The Lyra basin is located on the western side of the OJP. The depth of the seafloor in the Lyra basin get deeper toward the west, from 4000 to 5000 m. There is an NW-SE trending graben named Lyra Trough crossing the Lyra basin. The survey lines of Lyra basins were two lines. One is parallel to the Lyra

trough, and another is perpendicular to the trough.

We found several tectonic and intrusion structures in the Lyra basin. The relief of the acoustic basements in the basins are rough. This rough relief is caused by intrusions and extrusions. These intrusions and extrusions support recent volcanism in Lyra basin (Shimizu et al., 2015). We identified many normal faults with displacements about 10-20 m. Some of these faults reach seafloor. There are normal faults with displacements about 600 m in survey line of perpendicular to the Lyra trough. These large faults formed step-like acoustic basement. Theses faults are covered with sedimentary layer which not deformed. This may be related to the formation of Lyra trough.