Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

SVC007-03 会場:301B 時間:5 月 27 日 15:15-15:30

Deep structural images of the Ontong Java Plateau deduced from an active source seismic experiment
Deep structural images of the Ontong Java Plateau deduced from an active source seismic experiment

三浦 誠一 [1*], 野口 直人 [1], Millard F. Coffin[2], Simon A. Kawagle[3], Ronald T. Verave[4], 小平 秀一 [1], 深尾 良夫 [1]
Seiichi Miura[1*], Naoto Noguchi[1], Millard F. Coffin[2], Simon A. Kawagle[3], Ronald T. Verave[4], Shuichi Kodaira[1], Yoshio Fukao[1]

[1]JAMSTEC, [2]University of Tasmania, Australia, [3]Univ. of Papua New Guinea, PNG, [4]Mineral Resource Authority, PNG
[1]JAMSTEC, [2]University of Tasmania, Australia, [3]Univ. of Papua New Guinea, PNG, [4]Mineral Resource Authority, PNG

The Ontong Java Plateau (OJP) is one of the large igneous provinces (LIPs) located on the western rim of the Pacific Ocean and is colliding with the Solomon Island Arc. The OJP is a shallow oceanic plateau outlined primarily by the 4000-m isobath (Mahoney et al., 2001), and its area is one-third that of the contiguous United States (Coffin and Eldholm, 1994). Shallow bathymetry suggests that OJP crust is thicker than that of normal oceanic crust. However, how the plateau formed is still under debate, with three primary models proposed: plume, bolide impact, and fast spreading ridge. Moreover, the OJP seems to have formed in a deep marine environment, which is not clearly explained. To understand the formation mechanism of the OJP, an active source seismic experiment was conducted over the central OJP by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) in February/March 2010. The active seismic source was a 7800 cu. in. tuned airgun array aiming to penetrate the OJP′s entire crustal thickness down to the Moho. A 444-channel hydrophone streamer was towed to acquire multi-channel reflection seismic reflection (MCS) data. One hundred ocean bottom seismographs (OBS) were also deployed on the OJP′s seafloor to acquire wide-angle reflection and refraction data. The new MCS data show clear sedimentary sequences in the shallow part of the OJP about 1 s thick in two-way travel time (TWT), and unnamed seamounts penetrate the sedimentary sequences suggesting magmatism following the main construction of the OJP. The MCS data also show a deep reflection event at about 11-12 s in TWT indicating a major acoustic impedance contrast such as the Moho. OBS data show a prominent refraction event with an apparent velocity of 7 km/s, which indicates a thick lower crust. No clear refraction events from the uppermost mantle are identified except at the northern edge of the OJP′s main body. From these observations, we will discuss models for the formation of the OJP and LIPs.

キーワード: LIPs, OJP, MCS, OBS
Keywords: LIPs, OJP, MCS, OBS