Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SCG64-23 Room:A05 Time:May 28 11:00-11:15

Crustal thickness of the Ontong Java Plateau revealed from traveltime inversion analysis

MIURA, Seiichi[1*] ; FUJIE, Gou[1] ; NOGUCHI, Naoto[1] ; KODAIRA, Shuichi[1] ; COFFIN, Millard[2] ;
KAWAGLE, Simon[3] ; VERAVE, Ronald[4]

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

The Ontong Java Plateau (OJP) is the largest oceanic plateau on Earth, located in the western equatorial Pacific and delineated by the 4000-m bathymetric contour. It is five times as large as the Japanese islands. From the results of sampling and drilling, the OJP is a representative example of large igneous provinces (LIPs) (e.g. Coffin and Eldholm, 1994), which do not fit plate tectonic theory, and no formation model explains all existing observations from the OJP. Environmental impacts of OJP formation had the potential to be large scale as suggested by a geologically short interval of emplacement and the feature's large area and volume. To understand its formation and environmental impacts, investigation of the crustal structure of the OJP is important. Structural studies of the OJP began in the 1960s. Since then, the few studies have determined the Moho depth beneath the OJP, which have varied according to survey method. For example, the Moho depths of seismic (Furumoto et al., 1976) and gravity (Sandwell and Renkin, 1988) studies are 35-42 km and 25 km, respectively. The Moho depth beneath the southernmost OJP is 35 km, as determined by a forward modeling approach (Miura et al., 2004), and an inversion analysis shows similar results (Korenaga, 2011). However, until recently the Moho depth at the center of the OJP has not been clearly determined and modern survey techniques were required. A seismic survey with 100 ocean bottom seismometers (OBS) across the center of the OJP was conducted in 2010 (Miura et al., 2011). First arrival traveltime tomography and forward modeling have been applied to the OBS data (Miura et al., 2013). Recently we have initiated traveltime inversion analysis of the OBS data using first arrivals and the largest amplitude later reflection phases (PmP), following noise reduction processing of reverberations from previous shots (Miura et al., 2014). Our analyses with initial models using various Moho depths show crustal thicknesses greater than those resulting from previous studies. Uncertainty analysis (Korenaga, 2011) will be applied to verify reliability of Moho depths.

Keywords: LIPs, OJP, MCS, OBS, traveltime, inversion