Estimation of thick crustal distribution of the Ontong Java Plateau

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The Ontong Java Plateau (OJP), which is the largest oceanic plateau on Earth, has an area of 1.86 x 10^6 km^2 (Coffin and Eldholm, 1994), five times Japan's area. Scientific drilling on the OJP has shown that ages of basement basalts below sediments are approximately 120 million years (Ma) (e.g. Shipboard Scientific Party, 2001), suggesting that formation of the OJP was geologically brief. No formation mechanism yet proposed explains all observations. Crustal structure is important for understanding the formation mechanism of oceanic plateaus, and geophysical experiments have been conducted on the OJP since the 1960s. However, only a few experiments addressed the whole crust, i.e., everything above the Moho (e.g. Furumoto et al., 1976, Gladczenko et al., 1997). The Moho depth of the southernmost OJP colliding with the Solomon Islands is about 35 km (Miura et al., 2004). However, the Moho depth of the central OJP has not been determined confidently because of discrepancies in results among different survey methods. In 2010, we conducted a seismic experiment on the central OJP using a large volume airgun array, 100 ocean bottom seismometers (OBS), and a 6 km multi-channel seismic (MCS) streamer cable (Miura et al., 2011). We analyzed the OBS data using a forward modelling approach (Miura et al., 2013), a traveltime inversion approach (Fujie et al., 2013) using first arrival and Moho reflection phases (PmP) with the uncertainty outlined by Korenaga (2011), and a finite-difference amplitude method (Larsen and Grieger, 1998) for reflection phases (Miura et al., 2014, 2015). From these analyses, the Moho depth of the central OJP exceeds 40-km below sea level. To estimate the distribution of the Moho depth or crustal thickness of the OJP outside of the 2010 survey area, we will analyze wide-angle data collected in 1998 by scientists aboard RV *Hakuho-maru* (Araki et al., 1998) and previous results (e.g. Furumoto et al., 1976, Gladczenko et al., 1997) to calculate crustal volume and formation rate. These will contribute to resolving the mechanism(s) by which OJP formed and to assessing the environmental impact of formation.

Keywords: LIPs, OJP, MCS, OBS, crust, Moho

