Crustal structure of the Ontong Java Plateau revealed from seismic surveys

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The Ontong Java Plateau (OJP), one of the largest oceanic plateaus on Earth, lies in the western equatorial Pacific Ocean, and is mainly defined by the 4000 m bathymetric contour (Mahoney et al., 2001). The main part of the OJP, the so-called High plateau, is shallower than 2000 m, and includes several atolls. The OJP's eastern salient extends eastward and southeastward from the High plateau and lies deeper. Since the 1970s, geophysical investigations, including seismic surveys, have been undertaken to reveal the OJP's structure (e.g. Furumoto et al., 1976). Although shallow water depths suggest that OJP crust is thick, seismic and gravity analyses have produced significantly different crustal thicknesses. For example, the maximum Moho depth determined from the first seismic refraction data from the northern High plateau was 42 km (Furumoto et al., 1976), whereas that from gravity data was 25 km (Sandwell and Renkin, 1988). In 1995, a seismic refraction transect was undertaken from the southern OJP to the Australian plate (Miura et al., 2004), and showed the Moho depth to be about 35 km below sea level for the southernmost OJP. To reveal the structure of the OJP's High plateau, we conducted an active source seismic experiment utilising a 128 liter active seismic source, 100 ocean bottom seismometers, and an approximately 6000 m streamer in 2010 (Miura et al., 2011), the first investigation of such scale on the OJP. The new reflection and refraction data are of high quality and image both the shallow sedimentary sequences and deep crustal reflections of the OJP. In this presentation, we will review previous seismic work on the OJP, show initial crustal structure interpretations resulting from our new seismic data, and discuss potential models for formation of the OJP.