

## Crustal velocity model of Okinawa Rise (Urdaneta Plateau) clarified by a wide-angle seismic experiment

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Okinawa rise (Urdaneta Plateau) is bathymetric high located in the north-west side of the West Philippine Basin (WPB). It is supposed to have been formed simultaneously to the Benham Rise at the western side of the Central Basin Spreading Center, running east-west across the central part of the WPB. These bathymetric highs formed by an abundant supply of magma are characteristic feature in the western WPB and would be a clue to clarify the opening and development process of the WPB. Though small amount of rock samples were obtained from Okinawa Rise and Benham Rise by dredges and ODP, crustal structure model of the rises has not been proposed by systematic seismic experiments.

Hydrographic and Oceanographic Department, Japan Coast Guard conducted a wide-angle seismic experiment on a line passing through Okinawa Rise and the western Oki Daito Ridge in May 2005 to clarify the crustal model of these features and their relation. Total 150 ocean bottom seismographs (OBS) were deployed on the 750 km experimental line at a 5 km spacing. Sampling rate and preamp gain of geophone and hydrophone sensor were set to 200 Hz and 40 dB, respectively. As a seismic source, a tuned airgun array composed of 36 guns (total 131.8 liter; 8040 cubic inch) was shot every 200 m firing to provide high resolution data set. Besides a wide-angle seismic experiment, multi-channel seismic reflection experiment was also conducted on the same line at every 50 m airgun firing.

All OBSs were retrieved without any accident. OBSs generally recorded clear signals propagated from 200 km far offset up to 300 km and high S/N data.

First arrival travel times of P wave were picked up from the filtered record sections and applied to a two-dimensional tomographic inversion and a two-dimensional forward modeling using graph theory to construct a structure model, taking into consideration the shallow structure revealed from the reflection experiment. Later phase of P refraction waves and PmPs are also referred to estimate the seismic velocity in lower crust and the seismic Moho depth.

Obtained crustal velocity model reveals that Okinawa Rise is mainly composed of two crustal blocks, northern part and southern part. These two blocks have similar size (100 km wide) and crust thickness (12 km). At an east-west lying submarine canyon exceeding 5000 m in depth between Okinawa Rise and the Oki Daito Ridge, the crust thickness suddenly decreases to about 5 km with sharp boundaries. The crust thickness and velocity structure of a bathymetric high located south-west to the Oki Daito Ridge is similar to Okinawa Rise except for in size and a complexity of shallow crustal structure, however, different from those of the Oki Daito Ridge especially in its velocity structure of the upper crust.