

Gravity anomalies and crustal thickness of the Shikoku and Parece Vela Basins

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Crustal thicknesses of the Shikoku and Parece Vela Basins were gravimetrically determined on a simple assumption of four layers: seawater, sediments, crust and lithospheric mantle, with densities of 1030, 2300, 2800 and 3300 kg/m³, respectively. Seawater depths were obtained from the multibeam bathymetry data collected by the Continental Shelf Survey Project of the Hydrographic and Oceanographic Department of Japan, while the sediment thicknesses were calculated from the multichannel seismic data collected by the Program of Deep Sea Survey Technologies for Natural Resources carried out by the Japan Oil, Gas and Metals National Corporation. Free-air anomalies were calculated from the marine gravity data collected by the above two projects. As for the correction of the regional gravity variation, we only take into consideration 15 km difference of the lithospheric thickness with a density difference of 50 kg/m³ against the asthenosphere below between both sides of the Kyushu-Palau Ridge. Mantle Bouguer anomalies were calculated on an assumption of constant crustal thickness of 6 km, then the crustal thicknesses were obtained by three-dimensional gravity inversion method. The results show occurrence of thin crust areas with a thickness around 5 km in the southern part and at the western end of the Shikoku Basin and also thick crust areas in the north-western and northeastern parts of the Parece Vela Basin. We suggest that these are due to the variation of magma supply at the time of sea-floor spreading in the Shikoku and Parece Vela Basins, which is possibly related with the variation of spreading rate.