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Refined crustal structure of Ogasawara Plateau - keys to estimate its formation process

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The Ogasawara Plateau is a conspicuous topographic feature on the northwestern Pacific Basin, with an area of larger than 40,000 square kilometers. Its top is approximately with a depth of 1000 m, relatively >4000 m higher than surrounding flat deep oceanic floor. Previous studies revealed that the plateau was covered with thick Cretaceous carbonates and located on the late Jurassic oceanic seafloor, indicating that igneous formation of the Ogasawara Plateau occurred within Late Jurassic to Cretaceous periods.

However its accurate formation model has not been constructed yet. Did concentration of intraplate igneous activities, similar to volcanism forming many seamounts around the Ogasawara Plateau, in the limited area contribute to form its large body? Or did a large-scaled igneous activity occur during a short period?

Japan Coast Guard conducted large-scaled seismic reflection experiments with multi-channel streamer cable and refraction experiments with ocean bottom seismographs on the Ogasawara Plateau with four long survey lines which total length exceeds 2,000 km. Our former seismic data analysis made clear important results that crustal thickness of the Ogasawara Plateau is >20 km, similar to that of the Izu-Ogasawara arc, and that the Ogasawara Plateau seems to collide with the arc on the Philippine Sea plate at a trench. However crustal structure of the plateau has not been analyzed well in detail. To estimate a formation process of the Ogasawara Plateau, a more accurate analysis in a velocity structure of the plateau crust was applied. Its result shows layered structure of the Ogasawara Plateau crust and will give important keys not only to construct its formation model but also to reveal what it is.

Keywords: crustal structure, Ogasawara Plateau