Development of marine geoid model around Japan

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In Hydrographic and oceanographic department of Japan Coastal Guard, Ganeko(1980) had determined a marine geoid model around Japan using GEM-10 (22nd-order Global Gravity poteitial model) and network adjusted 3”x3” marine gravity data. In this study, we studied and determined the higher resolution geoid model by using latest data and analyzing method.

We adopted 1D-FFT of modified stokes integral in a remove-restore manner as analyzing method We used GGM-CG03 for the long period components and land-and-sea gravity data or altimetry gravity data were used for short period components. We used Featherstone(2003) for modified stokes kernel.

Marine gravity dataset expands to southern region (20deg. N) and eastern region (160 deg. E) of Japan. We removed anomalous data by running average method, corrected tilt of each cruise by COE(cross of error) check and we corrected biases of cruise data by comparing with altimetry gravity data.

For land gravity data, we used ”Gravity CD-ROM of Japan Ver.2” published by Geological Survey of Japan, The National Institute of Advanced Industrial Science and Technology, and Bouguer reduction was applied.

We calculated sea surface dynamic height by using above geoid model and sea surface height measured by TOPEX/POSEIDON and compared it with one obtained from CTD observation. The correlation coefficient was about 0.97 for a path.