

日本南方海域におけるTOPEX/POSEIDON軌道下の ジオイドの高精度化

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Abstract

To improve the geoid profile in the region south of Japan as accurate enough to detect geostrophic currents, oceanographic observations along the ground tracks of TOPEX/POSEIDON including CTD casts and an IES (Inverted Echo Sounder) measurement at a point south off the Kuroshio were carried out for the period from November 1992 to May 1994. It is suggested that the warm water off the Kuroshio south of Cape Ashizuri piled up in November 1993, when the travel time observed with IES was shorter than other period. By comparing the time series of IES travel time, dynamic heights calculated from CTD casts at the mooring point of IES, and altimetric sea surface heights (ASSH) obtained by TOPEX/POSEIDON, it is shown that the relationship between IES travel time and dynamic heights from CTD is almost linear; the correlation coefficient is about 0.99. It is also pointed out that the altimeter of TOPEX/POSEIDON accurately observes temporal variation of the dynamic height, because ASSH and IES time series shows rather good correlation. Spatial profiles of ASSH using available geoid models, however, are not reliable enough to detect the Kuroshio paths, because mean sea surface in the MGDR (Merged Geophysical Data Record) data set distributed from the Jet Pulsesion Laboratory or other geoid models still contain anacceptable error of 20 cm or more. Corrections for ASSH to determine the Kuroshio paths by satellite altimeter are made by means of comparing ASSH and dynamic heights obtained from in situ CTD. The accuracy of ASSH after correction is estimated to be less than 10cm.