AN OCEAN BOTTOM PRESSURE MEASURMENT PROJECT AT OFF SANRIKU

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Variable motions of the ocean strongly affect the gravity observation, and the gravity changes due to the ocean motions are clearly detected by such sensitive gravimeter as superconducting gravimeter (SG) over the wide frequency range from the seismic normal mode band to the Earth's polar motion. On the other hand, the recent progress in the satellite altimetry and the general circulation model are remarkable, and they enable us to estimate the oceanic effects on the gravity observation based on the global grid data for time variations in the sea surface height (SSH) field. However, the altimeter data are affected by steric changes in the ocean, which could not contribute to the observed gravity changes. To know the actual mass transportation in the ocean is important not only to study in gravity but also to study in Earth system dynamics. In order to examine the relation among the gravity change, the SSH change and the mass change in the ocean, in 2001, we started a three-year observation project to compare the three different kinds data obtained from the SG at Easashi, Japan, the ocean bottom pressure gauges (OBPGs) and the satellite altimeter. For this, three OBPGs were installed at the three crossover points of TOPEX/Poseidon altimeter tracks. Their positions are; Point-A: 143.1E, 39.2N, Point-B: 146.0E, 39.2N, and Point-N: 144.6E, 41.5N in longitude and latitude. The data are sampled at a sampling interval of 1 minute. To observe the signals up to the annual variation in period, the OBPGs are recovered at a cycle once a year and are immediately reinstalled after down loading the data stored in the OBPGs and being maintained on an observation ship. The data obtained from the first observation period (i.e. September 2001 to July 2002) were analyzed. Although the sensor at Point-N show something a peculiar time variation, we have confirmed that the two sensors at Point-A and Point-B record clear tide signals and their residuals after subtracting tide signals show a coherent variation with the gravity residuals after subtracting the tides and the air pressure effect. We discuss the comparison results among the three different observations and the problems in the OBPG observation suggested from our experiment.