Proc. NIPR Symp. Antarct. Geosci., 6, 141, 1993

PRELIMINARY REPORT OF SURFACE SHIP GRAVITY MEASUREMENTS CONDUCTED DURING JARE-33 (ABSTRACT)

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Gravity measurements on board the icebreaker SHIRASE have been conducted during the 33rd Japanese Antarctic Research Expedition (JARE-33). Although the purposes and the procedure for the gravity measurements are essentially the same as for previous expeditions, we have made mainly two improvements on the measuring system as follows.

The first modification is the improvement of the online data acquisition and data processing system, aiming at fully automatic measurement. While a mini-computer was used for processing in the previous system, two personal computers, which share the tasks, are employed in the present system. This down-sizing improves the total system reliability and decreases maintenance.

The second improvement is the employment of a GPS navigation system to determine the ship's positions, though the standard positioning system of SHIRASE is supplied based on the Navy Navigation Satellite System (NNSS). Since one of the most serious error sources of surface ship gravity measurements is the uncertainty of the Eötvös corrections which arise from inaccurate ship positions, the GPS system, which is much superior to NNSS, improves the final accuracy of the gravity values.

On the JARE-33 cruise, both of the above modifications worked well. According to the same compiling procedure since JARE-27, the obtained data have been processed and filed in the final form of gravity anomaly. Those data together with the previously compiled data should be used for further geophysical and geodetic studies in the Southern Ocean.

(Received April 3, 1993; Revised manuscript received June 3, 1993)