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Data reduction in scalar airborne gravimetry: a case study in Taiwan

CHEINWAY HWANG[1], YU-SHEN HSIAO[1] AND HSUAN-CHANG SHIH[1]

[1]*Department of Civil Engineering, National Chiao Tung University, 1001 Ta Hsueh Road, Hsinchu 300, Taiwan*

The paper presents theories and computer programs for data reduction in scalar airborne gravimetry. Numerical procedure and techniques are developed to compute velocities and accelerations from GPS-determined positions. A method based on the correlation analysis of raw gravity reading and vertical acceleration of aircraft is used to correct for gravimeter times. A method and a computer program for crossover adjustment of gravity values along survey lines are developed. This method allows flexible selection of a fixed survey line to overcome the rank defect problem. A computer program is developed to compute gravity anomalies while applying correction of gravimeter position and filtering. Upward and downward continuations of gravity anomalies are performed using Fast Fourier Transform. Using observed airborne gravity data along a survey line and simulated data over Taiwan, all the programs have been validated and produce reliable results.