Automated Gross Error Detection Technique Applied to the Gravity Database of Africa

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To establish the gravity database for the African Geoid Project, it is needed to remove the blunders from the available gravity data set. As the available gravity values for Africa on land is only about 100000 stations, the gross error detection technique should be smart enough to eliminate only the real blunders. A smart gross error detection technique has been then adopted. It is based on the least squares prediction algorithm. The technique works first to estimate the gravity value at the data station using other values than the current data point. It thus compares the estimated value to the data value for possible blunder detection. Hence the technique measures the influence of removing the data value of a current point on the neighbourhood stations. Only if the value of a certain station proves to be blunder, it is then removed from the data base. Only 500 points were detected through the adopted technique to be blunders, which represent about 0.5%. The maximum discrepancy between the data and estimated values after removing the blunders has dropped to less than 40 mgal.