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# A New Approach To Potential Field Data Collection

**K. A. Galybin** (1), F. Boschetti (2), M. Dentith (1)

(1) School Of Earth And Geographical Sciences, The University of Western Australia, Australia (kostia@tartarus.uwa.edu.au / Fax: +61 8 64881178 / Phone: +61 8 64881873 / mdentith@segs.uwa.edu.au / Fax: +61 8 6488 1037 / Phone: +61 8 64882676), (2) Exploration and Mining, CSIRO, Western Australia, Australia (Fabio.Boschetti@csiro.au / Fax: +61 8 6436 8555 / Phone: + 61 8 6436 8621)

Oversampling of regional components and aliasing of residuals are the major problems associated with gravity and magnetic data collection. The latter is the bigger problem. Aliasing, especially of the residuals, whether gravity or magnetic, is a result of inadequate sampling of the field. Hence, information about the frequency content of the anomaly is distorted, decreasing the ease of interpretation of data. Therefore new methods of data collection are needed to rectify this situation.

This study presents a new strategy for design of potential field surveys. It is based on non-uniform sampling of data. The strategy comprises several stages. The first stage is design and implementation of a primary, large station spacing survey that acts as the first approximation for the main, secondary survey. This task is based on estimation of the expected size of the anomaly. In the second stage, the data from the primary survey are used to prepare an anomaly edge density map, thus defining the parts of the studied region that require higher sampling, and those that require lower, sampling frequencies. As a result, a non-uniform sampling array is produced. To improve the logistics of data collection for this non-uniform sampling array, a simulated annealing algorithm is applied to determine a close-to-optimal path for collection of data.

This strategy results in different sampling rates for regional components and anomalies, thus maximising the ratio of useful measurements to the total number of measurements made, producing a highly accurate dataset and reducing time and budget constraints associated with collection of the data.