

IMPROVEMENTS IN GEOLOGICAL MAPPING USING OPTIMISED AIRBORNE ELECTROMAGNETIC DATA

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A number of current airborne electromagnetic systems allow important system parameters such as waveform, transmitter moment and receiver delay times to be configured in order to improve detection of specific geological targets. In most such systems, however, measurements are made using a set of 'standard' measurement parameters which do not necessarily provide optimal resolution of targets of interest.

The SkyTEM AEM system is capable of measurements at a range of transmitter base frequencies from 5 Hz – more than 250 Hz. The system is also capable of collecting interleaved data at high and low base frequencies over a wide range of delay times, thereby achieving a large depth of investigation while at the same time preserving high spatial and depth resolution in the near surface. The best system parameters for a given exploration target can be decided by forward modelling based on expected target properties and dimensions, and on the established noise levels of the SkyTEM system. An approximate 1-D inversion can be carried out on SkyTEM field data within a few hours after the completion of each survey flight, thereby allowing assessment and further optimization of data acquisition parameters during the initial stages of a survey. Improvements in quantitative interpretation of the data achieved by combining data from multiple transmitter base frequencies and moments are illustrated using Australian field data examples.