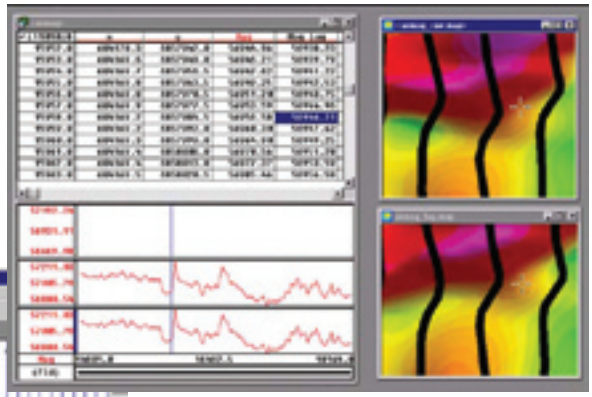
GEOSOFT Oasis montaj

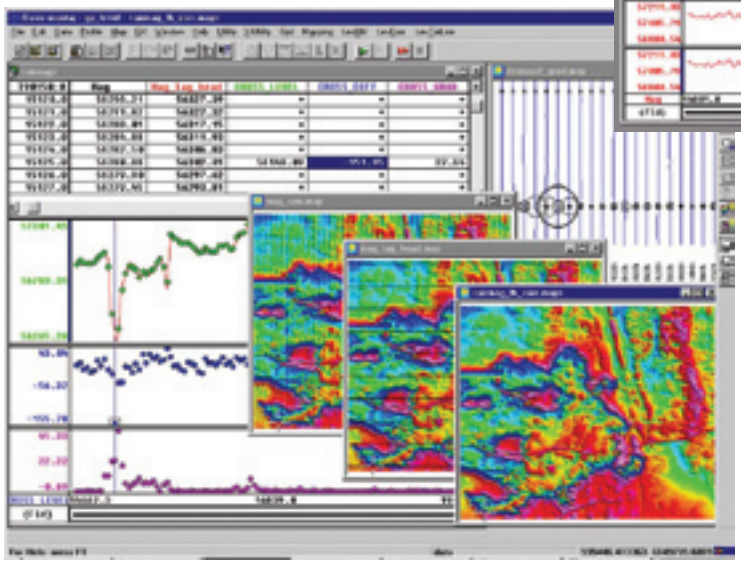
Geophysics Levelling

montaj Extension developed by Geosoft

The montaj™ Geophysics Levelling extension includes advanced functionality for processing and enhancing airborne magnetic and other geophysical data. This extension provides a step-by-step methodology for accomplishing a variety of levelling and correction tasks.

A Microlevelling function enables you to perform microlevelling corrections on linebased data.





Line Levelling

Statistical levelling corrects for intersection errors (miss ties) that follow a specific pattern or trend. The algorithm calculates a least-squares trend line through an error channel to derive a trend error curve, which is then added to the channel to be levelled.

The objective of full line levelling is to adjust the survey lines so that all lines match the trended tie lines exactly at each intersection that has been included in the process.

The line levelling system:

- Identifies potential errors in data sets,
- Applies systematic corrections including magnetic base station, lag and heading corrections and select line direction,
- Performs conventional levelling using simple (tie line and full levelling) and careful levelling methods.

Use Geophysics Levelling to:

- Evaluate data for systematic error and noise,
- Correct systematic errors in geophysical data (magnetic base station, lag, heading, and IGRF corrections),
- Find and edit intersections (between any lines in a dataset),
- Perform statistical levelling of tie lines (lines can either be regular survey lines and tie lines),
- Perform full and careful levelling of survey lines,
- Perform microlevelling corrections on line-based data,
- Remove any low amplitude component of flight, line noise still remaining in airborne survey data after tie line leveling,
- Minimize or remove different survey parameters, noise levels, or uncertainties at the grid edges to create more seamless grid compilations and identify subtle geophysical anomalies.

Line Intersections

The output intersection table file tabulates every intersection between tie lines and regular survey lines. It includes the exact ground location of the intersection point, the tie line and survey line numbers, the recorded value on each line, and the horizontal gradient of the data at that location.

The line intersection system can find and edit intersection between any lines in a data set (lines can either be regular survey lines or tie lines).

Lag, Heading and Base Station Corrections

Correction routines include applying a:

- Lag correction to a channel of data by shifting the start fiducial by a specified lag amount,
- Heading correction to data for a systematic shift (in the data) that is a function of the direction of travel for a survey line,
- Magnetic base station correction to a magnetic channel.

International Geomagnetic Reference Field Correction

The International Geomagnetic Reference Field (IGRF) or the Definitive International Geomagnetic Reference Field DGRF correction (field strength, inclination and declination) can be calculated from a geographic coordinate channel or a single geographic point.

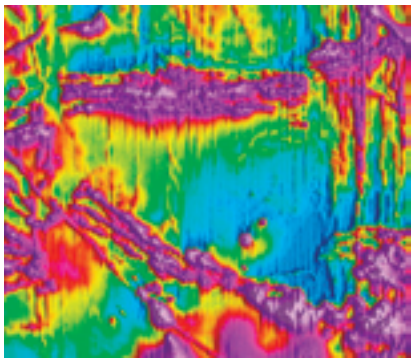
Microlevelling

Geophysics Leveling includes PGW's algorithm for microlevelling, which removes any low amplitude component of flight line noise still remaining in airborne survey data after tie line levelling.

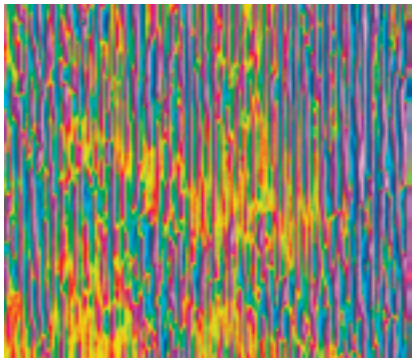
The technique uses a combination of frequency and space-domain filters to clearly separate geological signal from noise. A number of parameters enable the user to control the filtering (microlevelling) process. The corrections are applied to the profile data.

Microlevelling offers an improvement over conventional decorrugation levelling techniques, allowing a greater degree of control in discriminating between noise and geology.

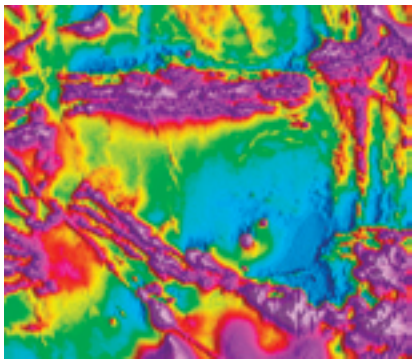
Microlevelled grids allow the interpreter to identify subtle geophysical anomalies. It is often difficult to create an accurate compilation using grids with different survey parameters, noise levels, or uncertainties at the grid edges. The Microlevelling function minimizes or removes these differences, enabling you to create more seamless grid compilations.



Original Grid



Noise Grid



Microlevelled Grid

*The montaj Geophysics Levelling extension requires Geosoft's Oasis montaj.

Key Functionality

The montaj Geophysics Levelling extension provides these key functions:

- Line levelling correction,
- Line intersections system,
- Lag, heading and base station corrections,
- International Geomagnetic Reference Field (IGRF) correction,
- Microlevelling algorithm.

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