**Application of Gravity Gradiometry in Salt Basin Modelling**

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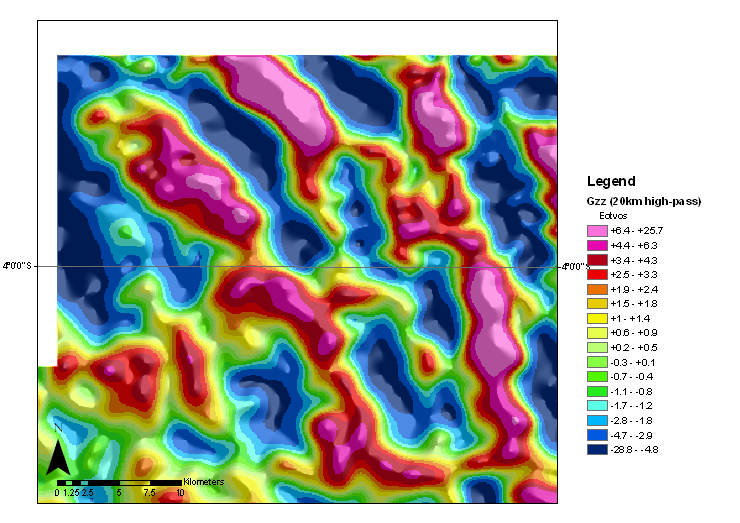
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This paper demonstrates the use of Full Tensor Gravity Gradient Imaging (GGI) as an exploration tool within a salt basin province. In May 2010 Gravity Gradient data was acquired over 9000 km2 of the Gabon Atlantic Margin to; (1) compare and contrast GGI with ‘conventional’ gravity observations, (2) better image carbonate / salt structures, (3) demonstrate the ability of GGI to image structures in ultra deepwater and (4), demonstrate the shelf life of a GGI dataset by incorporating the data into a joint Seismic Velocity Modelling workflow, thus providing a better image of the subsalt structure. This paper will report on the outcome of the study and draw parallels between the Gabon dataset and areas in Kazakhstan where GGI would aid salt basin modelling. This will be done using a GGI feasibility study approach, where the 3D input model is based on seismic data acquired by CGGV over the Northern Caspian area.

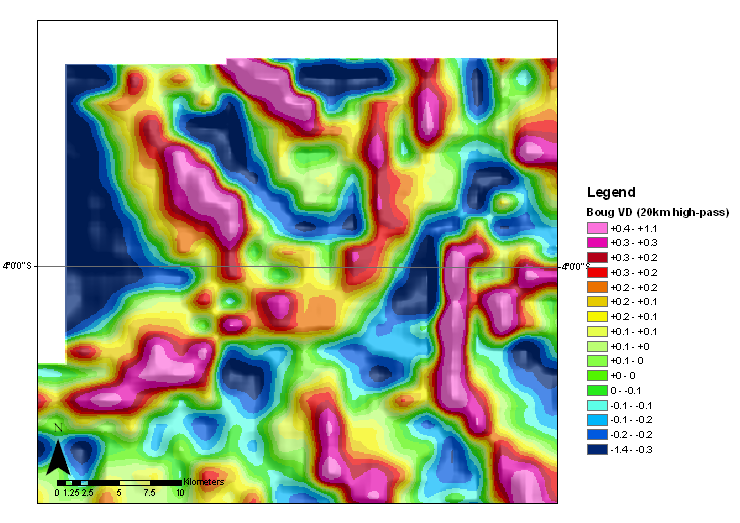
Gravity Gradiometry imaging (GGI) is a powerful geophysical technique that provides a superior measurement of the earth’s gravitational field compared to that obtained with conventional gravity surveys. While a conventional gravity survey records a single component of the three-component gravitational force, usually in the vertical plane, Full Tensor GGI measures the derivative of all three components in all three directions. Being a differential measurement, Full Tensor GGI is inherently more sensitive to the distance of a mass anomaly, which has in the past led workers incorrectly to believe that it is only of use when resolving shallow structures. Indeed, GGI has been used successfully to resolve targets at depths in excess of 8 km and this is clearly demonstrated in the Gabon dataset where excellent correlation of salt, carbonate and basement structures is seen on seismic data acquired in ultra deepwater.

This paper will also demonstrate how the signals measured by a gradiometer are also suited to wide line spacing acquisition, more akin to a regional style exploration approach. This is primarily because GGI technology using a Full Tensor Gravity Gradiometer (FTGeX) has off-line, sideways, detection capabilities that provide an enhanced interpolation solution between acquisition lines. In short, GGI provides an uplift in resolution and lateral positioning of structures over that of conventional data, as evidenced in the Gabon GGI dataset.



Gravity Gradiometry - Gzz with 20km high-pass filter applied showing improved delineation of Carbonates (in red) and salt. Note for example the structuration within the Carbonates which is brought out by the increased spatial and spectral resolution.

*Subset of marine gravity and FTG survey data over the same area with approximately similar density of survey line coverage.*



Computed vertical gradient from marine Gravity (Gz) data with 20km high-pass filter applied to existing marine gravity data