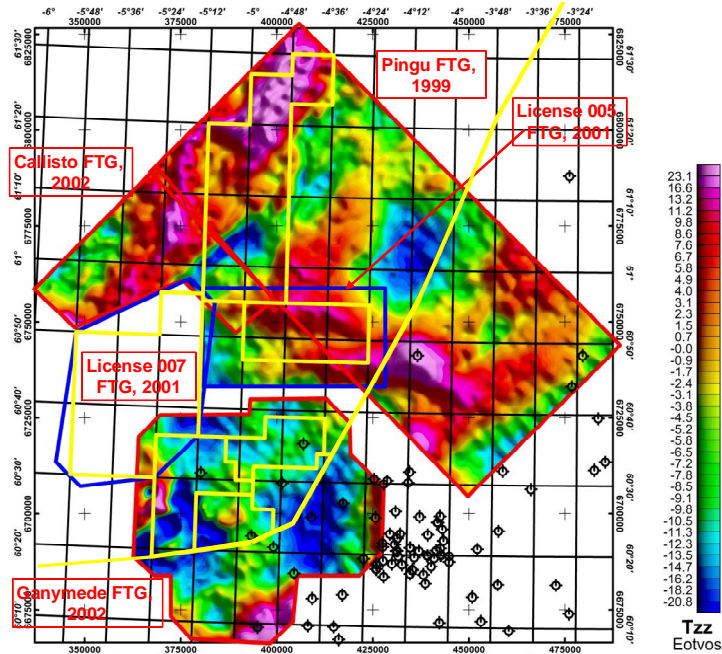


Bell Geospace: 3D Full Tensor Gradiometry Data from the Faroe-Shetland Basin Area



Introduction

- Bell Geospace develops and sells high resolution gravity based solutions for the oil & gas, minerals and government agencies using its **3D Full Tensor Gradiometry (FTG)** technology
- 3D-FTG resolves the **Total Gravity Field**, measuring 5 independent tensor components of the gradient field;
- Multi-directional mass information relating to target geology size, shape, thickness and geological setting are resolved;
- 3 Speculative (red outline) and 2 proprietary surveys (blue outline) were acquired in the Faroe-Shetland Basin area from 1999 to 2002:
 - All surveys were acquired with 750m in line spacing oriented NW-SE apart from the License 005 survey;
 - Data processing was conducted by Bell Geospace using a combination of commercial and proprietary software;
 - Objectives of surveys were to determine basalt complexity, sub-basalt and basement structure.

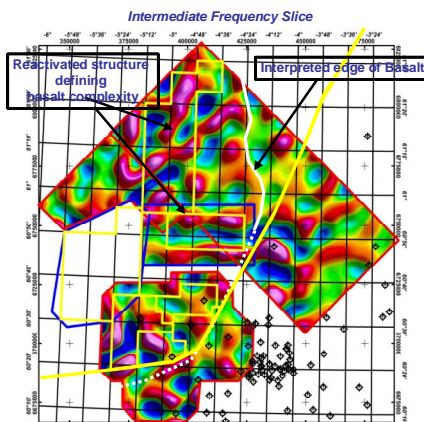
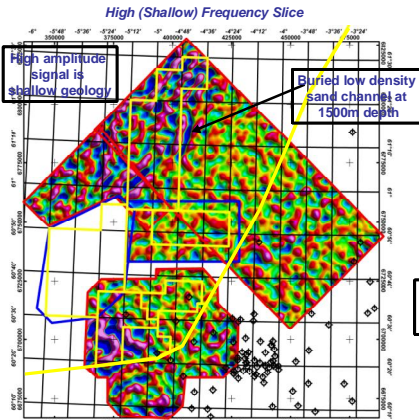


Separating the Signal – FTG Tzz identifies sub-basalt geology

- Frequency Filtering** of potential field data allows separation of signal from causative geology, i.e. it separates signal arising from low and high density features existing at variable depth ranges;
- The technique is applied to the **3D-FTG Tzz** data to quickly assess the geological complexity of the region, i.e. to identify and map the key geological features resolved in the data;

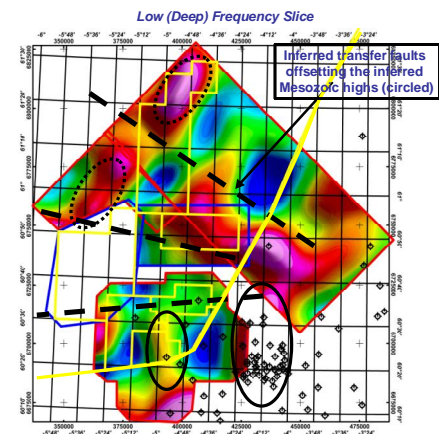
- The **high frequency** slice captures all geological features generating wavelengths from 3km to 10km;
- The strong amplitude signal arises from the near surface geology where bathymetry is relatively shallow;
- The indicated anomaly on the edge of License 006 corresponds to that of a buried sand channel at about 1500m depth;
- The **intermediate frequency** slice captures geology generating wavelengths between 10 and 20km;
- The high amplitude anomalies follow the known geological trends in the area and are interpreted as reactivation of underlying structure affecting the basalt;

- The indicated anomaly pattern is interpreted as the edge of the basalt;
- The **low frequency** slice contains all wavelengths greater than 20km;
- These are associated with regional scale geology either sourced as large shallow bodies or deep events;
- The known trends (NE-SW, NW-SE, N-S, ESE) in the area are clearly visible;
- The shorter wavelength anomalies in the deep slice are interpreted as Mesozoic blocks sitting on a deeper basement. The 2 known major discoveries are proximal to these highs, i.e. Foinaven-Schiehallion – Suilven and Marjun (both highlighted as solid polygons);
- Others may exist within Licenses 006 and the Callisto survey area (dotted polygons).



Identifying the known geology quickly allows the end-user to target specific areas for:

- Detailed interpretation** using all **3D-FTG Tensor Components**;
- Constraint** against other data, e.g. seismic, magnetic, MMT, well log data etc;
- 3D modelling** to examine validity of models and to determine best location for potential drilling target.



The following are acknowledged for permission to show data on this poster:

ENI Agip for permission to show the License 005 coverage;

Bell Geospace for the speculative surveys

For more information on 3D-FTG and Bell Geospace Contact **Colm Murphy / Gary Mumaw** at

Bell Geospace Limited,
 Unit 5A Crombie Lodge,
 ASTP Bridge of Don, **Tel: +44 1224 227704 / +44 1224 227728**
 Aberdeen AB22 8GU **Fax: +44 1224 227702**
 Scotland **Email: cmurphy@bellgeo.com / gmumaw@bellgeo.com**
Web: www.bellgeo.com

