

Air-FTG[®] Gravity Gradiometry Forward Model for Gas Hydrate Deposit

Introduction

Gas hydrate is ice-like mixtures of gases and water in which the gas molecules are trapped within a framework of cages of water molecules. Gas hydrates tend to form along the rims of sedimentary basins and over salt ridges.

Example: Mississippi Canyon blocks 852/853, Gulf of Mexico.

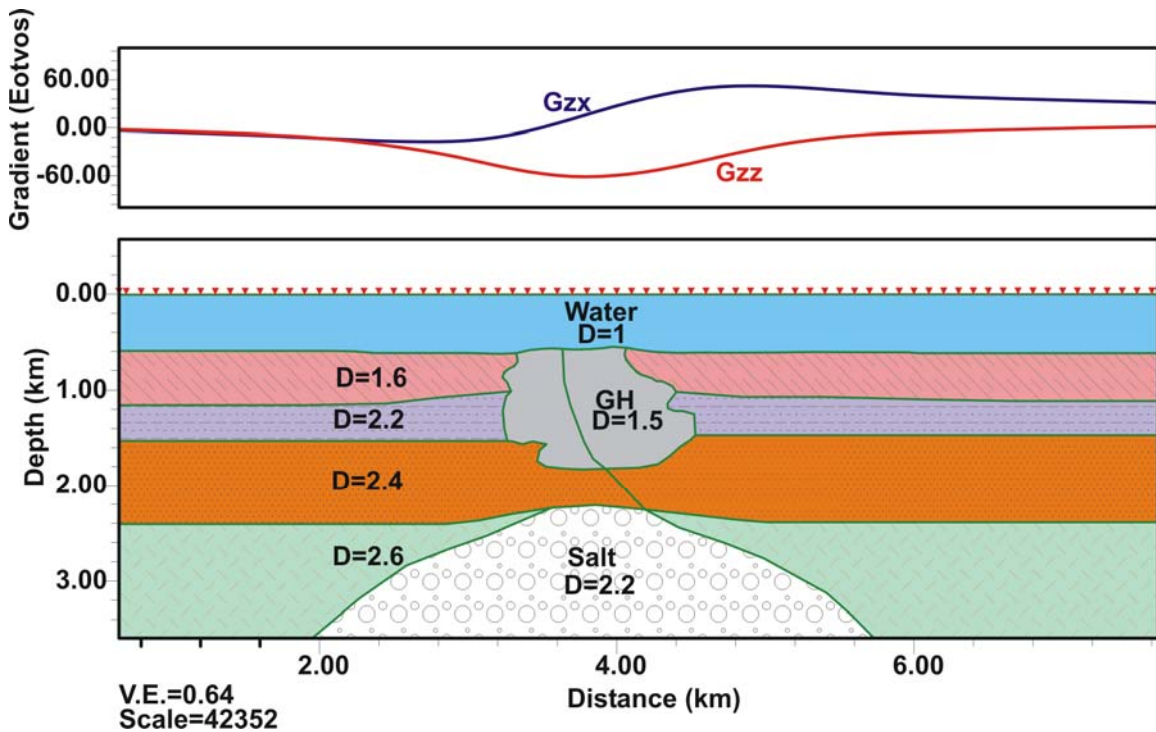


Fig.1. Gradient forward model for gas hydrate with all the lithologies.

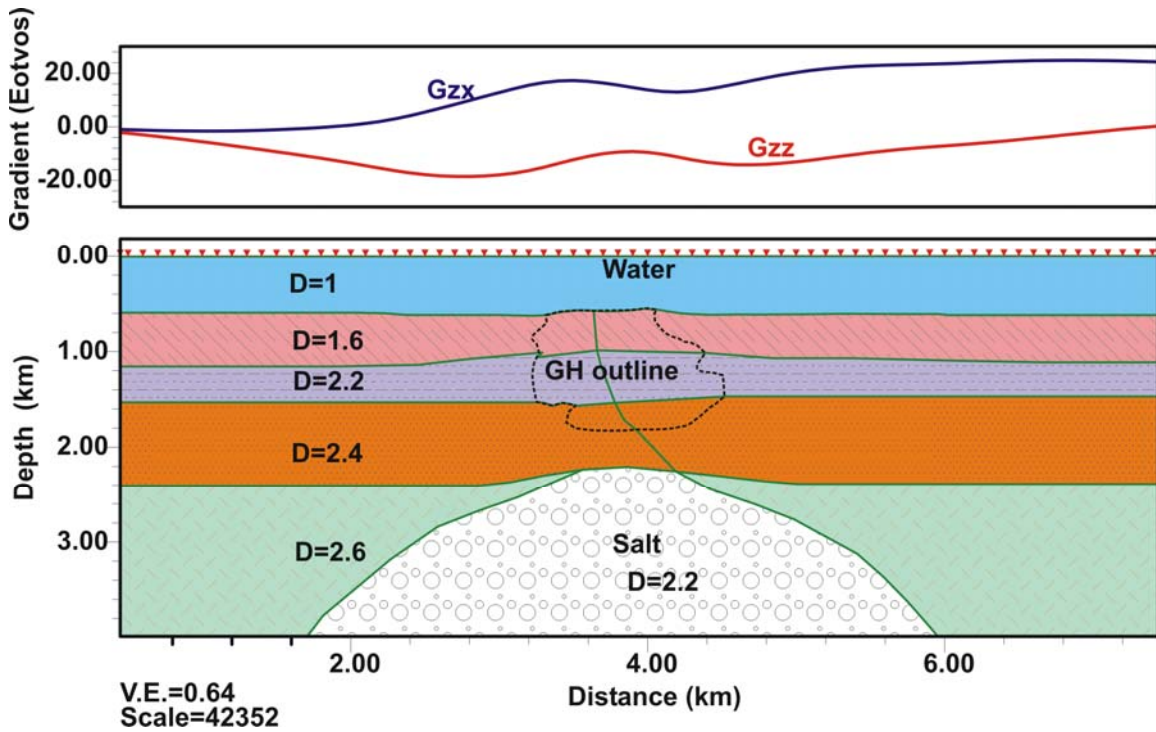


Fig.2. Gradient forward model without gas hydrate.

Air-FTG[®] gradient response of the VMS ore is calculated by taking the difference in gradient signals between the two models

G_{zz1} = Total Gradient response with all lithologies

G_{zz2} = Gradient response without GH

Gradient response of the GH = $G_{zz1} - G_{zz2}$

Gradient is measured in Eotvos units
 1Eotvos = 0.1mgal/km

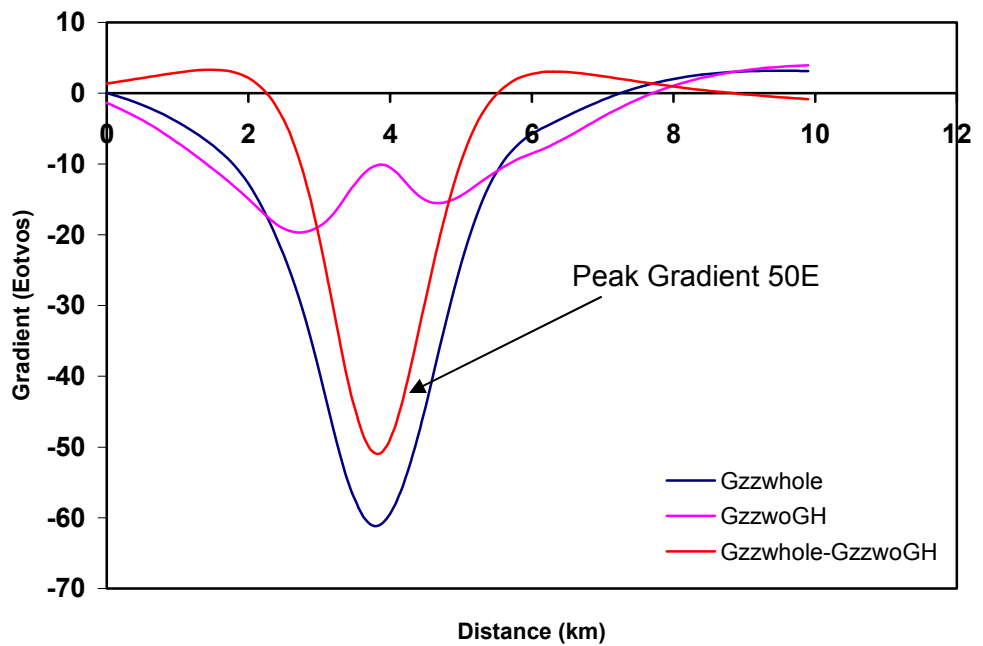


Fig. 3 Gradient determination curves for the gas hydrates

Conclusion

- A signal of 50 Eotvos obtained from gas hydrate deposit is large enough to be imaged using Air-FTG[®] system



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