

Air-FTG[®] Gravity Gradiometry Forward Model for Volcanogenic Massive Sulfide Deposit (VMS)

Introduction

These deposits occur as thin sheets of massive to well layered sulfides within interlayered, terrigenous clastic rocks and calcalkaline basaltic to andesitic tuffs. They can reach up to a few meters thick and up to kilometers in strike length and down dip; can be stacked lenses.

Example: *Noranda/Kuroko Massive Sulphide Cu-Pb-Zn.*

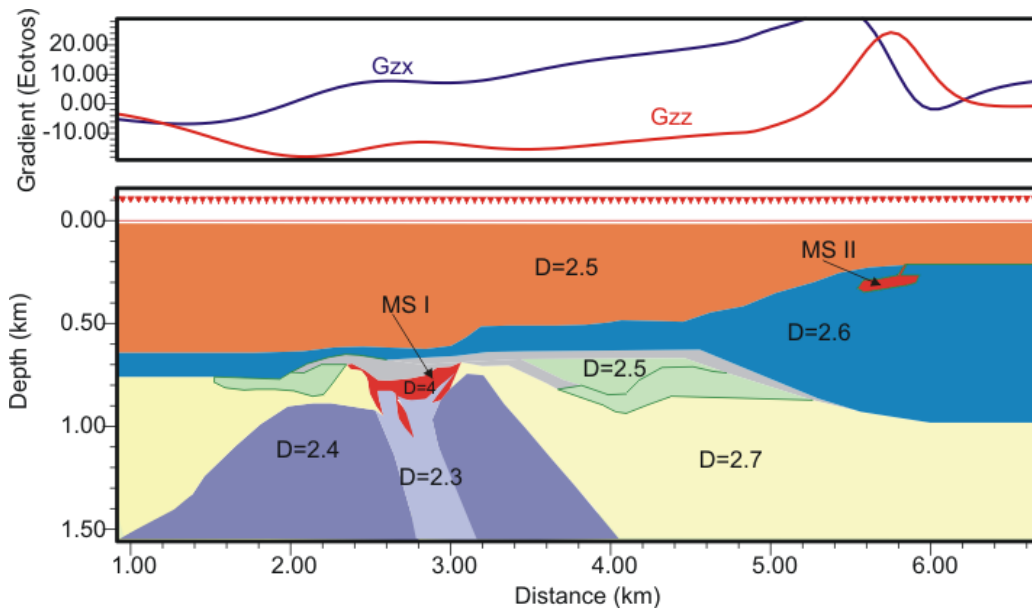


Fig.1. Gradient forward model for VMS with all lithologies.

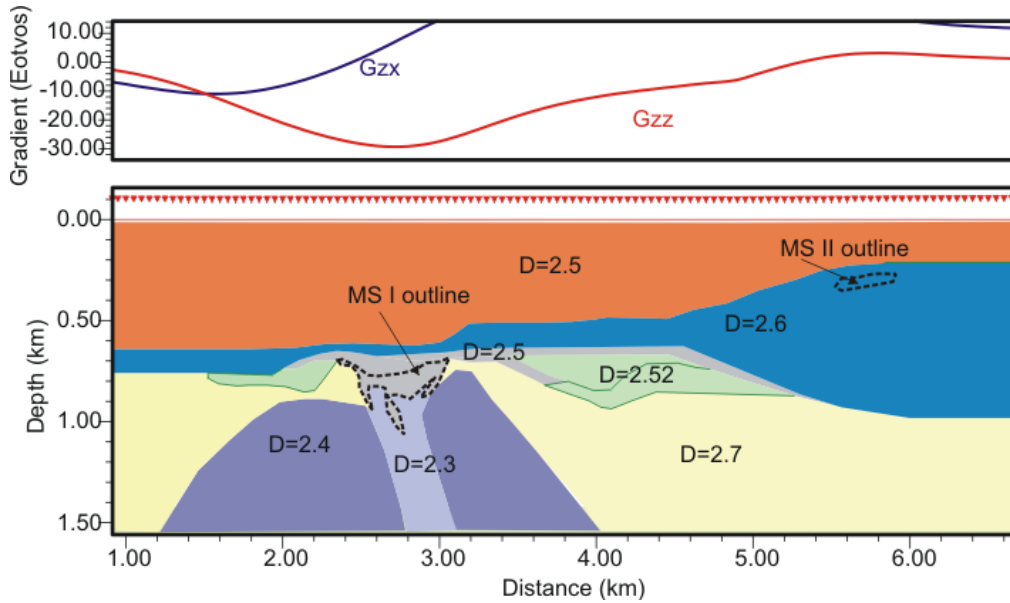


Fig.2. Gradient forward model for VMS without massive sulfide ores.

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

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

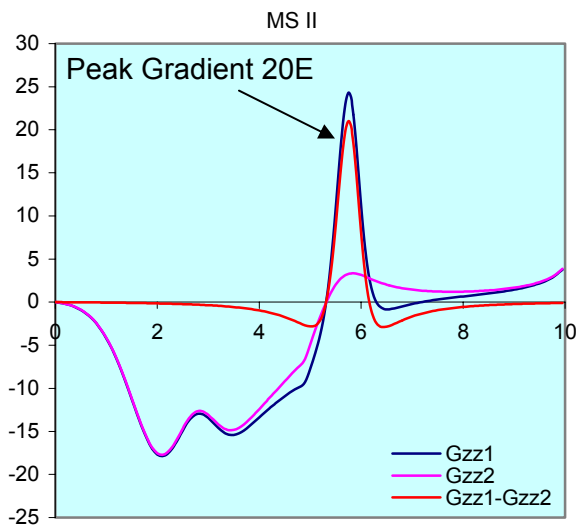


Fig. 4. Gradient determination curves for MS II

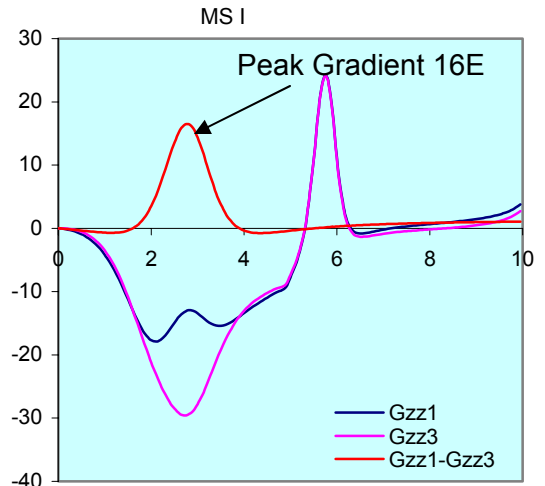


Fig. 3. Gradient determination curves for MS I

Conclusions

- Massive Sulfide deposits I and II produce gradient signals of 16 and 20 Eotvos respectively.
- Both deposits can be imaged using Air-FTG[®] system.



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