



## Identification of salt structures using combined inverse modeling of gravity and magnetic data in Garmsar area

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### Extended Abstract

#### Summary

Magnetic and gravity geophysical survey methods are mainly used in preliminary stages of exploration activities to achieve a general structural image of the area, and consequently, to obtain information as a basis for future exploratory stages. One of the most important issues in the interpretation of gravity and magnetic data is to use modeling methods in order to accurately identify subsurface structures. One of the procedures in modeling process is the inversion of gravity and magnetic data. In general, the inversion of geophysical data reveals two sets of parameters, namely physical and geometric parameters, for each of the subsurface structures. Inverse modeling of the acquired gravity and magnetic data have been used to identify the mass of salt in Garmsar area. In this regard, first, the results of inverse modeling of both sets of gravity and magnetic data have been compared, and then, combined inverse modeling of the data has been made. Based on the results of this study, a combination of magnetic and gravity data inversion using appropriate weighted coefficients is recommended.

### Introduction

As there is a close relationship between gravity and magnetic methods, these two methods are set into the group of potential field geophysical methods. Inverse modeling of geophysical data leads to determination of physical and geometric parameters of subsurface structures. Combined inversion of the data from gravity and magnetic methods has been used in this study to identify subsurface salt structures in Garmsar area

### Methodology and Approaches

After applying necessary correction on both gravity and magnetic data, the Bouguer anomaly in gravity method and total intensity anomaly in magnetic method were obtained. Then, inverse modeling of the gravity and magnetic data was performed using ZondGM2D software, and finally, combined inversion of the data was made by coding in MATLAB software.

### Results and Conclusions

The inverse modeling results of the acquired gravity and magnetic data in the study area indicate chimney salt masses. The movement of salt toward the ground surface has created differences in the models. Integrated inversion of the gravity and magnetic data has resulted in determination of the depth and lateral spreads of salt bodies in the subsurface of the area with good accuracy.