What magnetic maps and images should be used for magnetic interpretation: example from Heired gold exploration, Khorasan jnoobi

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Abstract
The effective display of magnetic data is crucial to the efficient interpretation of the data set. Selection of the format and design of the displays (function displayed, whether as profiles, contour maps, images, scale of presentation and use of color) is dependent on the facilities available and on these geophysical criteria - aims of interpretation, magnetic characteristics and geology of the area, and the survey specification. With very limited facilities available to the author ground magnetic measurements at Hired gold mineralization in Khorasan jnoobi is used to demonstrate a system of approach to the selection of displays for magnetic interpretation.

Introduction
The information available in magnetic data is generally underutilized and this is in part due to poor display of the data. Most of this data will be either on tape as digital data (airborne data) or xyz format (ground data) and cannot be interpreted until it is displayed. To maximize the amount of information extracted from the data set and overcome the limitations imposed by using only one kind of display format, several displays should be used to provide different perspectives. A wide range of presentations and enhancements are possible for magnetic data. Many examples can be found in the Geophysical literature particularly in ASEG, SEG and CSEG. Broom, 1990; Isles et al, 1991; Teskey and Hood, 1993; Milligan and Gunn, 1997; Liu and Mackay, 1998 have all discussed the presentation and interpretation of magnetic data. Considering limited available facilities in educational institutions in Iran particularly at the geology department of Ferdowsi university of Mashhad, a systematic approach leading to the selection of the most effective displays is presented here, and demonstrated using ground magnetic survey for gold exploration in Khorasan jnoobi, Iran as a case study.

Hired magnetic survey
Ground magnetic measurements were collected with ENVI magnetometer at 160 km. to the south of Birjand and 80 km. to the north of Nehbandan (figure1). Three exploration target area (exploration target 1 east and west and exploration target 3) were selected for magnetic measurement (figure 2). This work will present only the data from exploration target1 east area. At this location survey lines were oriented NE-SW and spaced 10 and 15 meter with sample spacing of 2 meter. Mineralogical studies and susceptibility measurements on drilled core indicated the presence of pyrrhotite associated with sulfide mineralization including gold only at the target1 east (Karimpoor et.al. 2007). There is a good correlation between susceptibility and gold grade on the bases of susceptibility measurements and geochemical analysis on drilled core. The host rocks for sulfide mineralization which are shale and ilmenite type granitoid intrusion are not magnetic (Karimpoor et al, 2007). Small scale image (1:50000) of high resolution aeromagnetic data from Geological Survey of Iran (GSI) was available for the regional area (figure 2). This image shows the magnetic responses of Granitoid intrusion with magnetic highs corresponding to magnetic type granitoid and lows to ilmenite type. Despite the high density (19.3 g/cm3) and electrical conductivity (5×105 S/m ) of gold it is almost impossible to get a direct geophysical response for it (Doyle, 1990). The small direct responses are a result of the low grades involved today (usually only a few grams per ton) because of the high value of gold. The magnetic contrast between sulfide mineralization associated with gold and host rock at exploration target1 east on Hired mineralization made the magnetic method suitable for direct identification of sulfide and indirect ejection of gold.