

USING SATELLITE IMAGERY AND GEOSPATIAL INFORMATION SYSTEMS TO ENHANCE GEOLOGICAL INTERPRETATION

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Abstract

The Shir Anticline with dimension about 74 Km² is an anticline structure which is located in a prospective area in the southern part of the Zagros Mountains (SW Iran). The numerous old hard copy data of this area, such as geological maps indicated the Upper-Miocene. Gachsaran Formation, as the oldest outcropping unit in this structure. This suggests the Oligo-Miocene, Asmari Formation, as a potential exploration target for this prospect. However, according to two old structural cross sections, the Asmari Formation cropped out to the surface and couldn't be considered as an exploration target. In order to overcome this confliction and reducing the costs of geological field trips, Remote Sensing data and Geospatial Information Systems were used to improve the interpretation of surface and subsurface formations in the Shir Anticline. We collected the old available data with rough accuracy and using main methods of image processing involved in this study were Principal Component Analysis (PCA), False Color Composite (FCC) and Hue Saturation Value (HSV) to enhance geological interpretation and provide a higher accuracy source of information in short time. Therefore data integration in GIS and their analysis in ARCGIS, especially satellite images and available geological data, led to preparation of a reliable map with detailed information. We use 5 GPS check points, to control and validate our results. The enhancement of the old geological maps in the office saves time and cost of geological trips.

Keywords: ETM, GIS, Geological Map, Remote Sensing, Zagros Mountains.