RESEARCH ARTICLE OPEN ACCESS

Investigating natural topography on the exploration process case study

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ABSTRACT:
One of the major problems in the oil exploration industry is the presence of extreme topographies of the area in question Various methods have been used to solve measurement problems One of these methods is to use the old Hatty method to solve the topography of the areawhich in turn has major problems. In this paper we have tried to solve these problems with the help of a new method. .
Key word oil exploration,topography

Date of Submission: 01-08-2017 Date of acceptance: 14-08-2017

Fig(1)Geology of area

I. INTRODUCTION

This region is apt for development of hydro–carbon reservoirs in the carbonate country rocks due to suitable interior earth structure such as numerous dome-shaped facial occurrences resulting from the uprising of the Paleozoic evaporative sediments The word fractal is derived from the Latin word 'fructus' which means an irregularly broken and ground rock. It was brought up in 1975 for the first time by Benoit B. Mandelbrot. In recent years, Mandelbrot's brownian fractional surfaces have attracted a lot of attention because of their noticeable similarity to topography (Mandelbrot, 1975, Good Child, 1980, 1982, Fournier, 1982). Observing shapes in the nature, it is concluded that Euclidean geometry is not able to state and

explain natural complex and apparently irregular shapes. In Euclidean geometry dimension is an integer such as one, two and three. As a consequence, Euclidean geometry is able to explain one, two, three and higher dimensional phenomena. The other observation is not to consider dimension of phenomena and events to be integer. In addition, we accept that dimension can be changed continuously from zero to one, one to two, two to three etc. For example, if a line is of dimension one and a plate is of dimension two, a dimension between one and two can be attributed to a hundreds-of-times broken line in accordance with intensity of breaks in the figure produced.

II. METHOD

Variogram method is widely used to identify dimension of fractal. Taking a large sample of couples of points (with different positions and distances) along with a profile and calculating the difference among their values, fractal dimension is easily obtained by drawing completely logarithmic graph of variance with respect to distance growth and calculating graph slope. Using this method, optimal density of the area can Calculations on the data of complete bouguer anomaly of the studied area made by surface Variogram method are as follows. Firstly, a point in the area with identified longitude and latitude is considered as center and a circle, centered at this point with the largest possible radius to draw, is drawn to include data as much as possible. This maximum distance is divided to 30 equal groups. Then, variance of bouguer data difference for each group is calculated and its logarithm is drawn with respect to logarithm of each group differences (Aronson, 1984). After investigating the graph, points which are supported by Earth's rigid crust and show fractal feature are selected and then we fit the regression line of least squares with them. The slope of this straight line which satisfies the formula y=mx+b demonstrates fractal dimension of line,

$$(1) \qquad E\ \{(Z_P - Z_q)^2\} = K(d_{pq})^{2H}$$

where Z_p and Z_q are surface values in the points q and p, d_{pq} horizontal difference among the points and H is equal to (3-D). Drawing logarithm of variance of differences caused by local complications of the surface with respect to be logarithm of distance among the points results in a graph which the existence of a linear relation achieved along the domain implies self-similarity

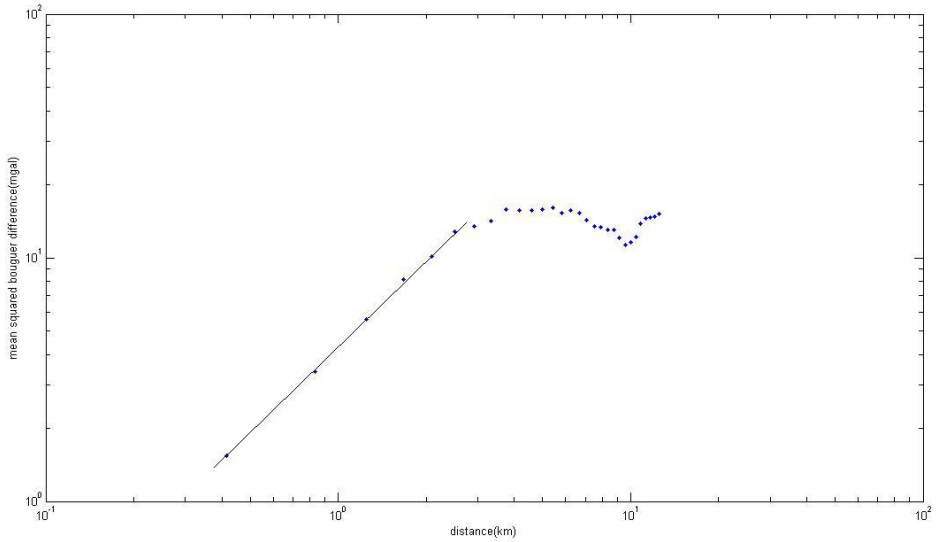
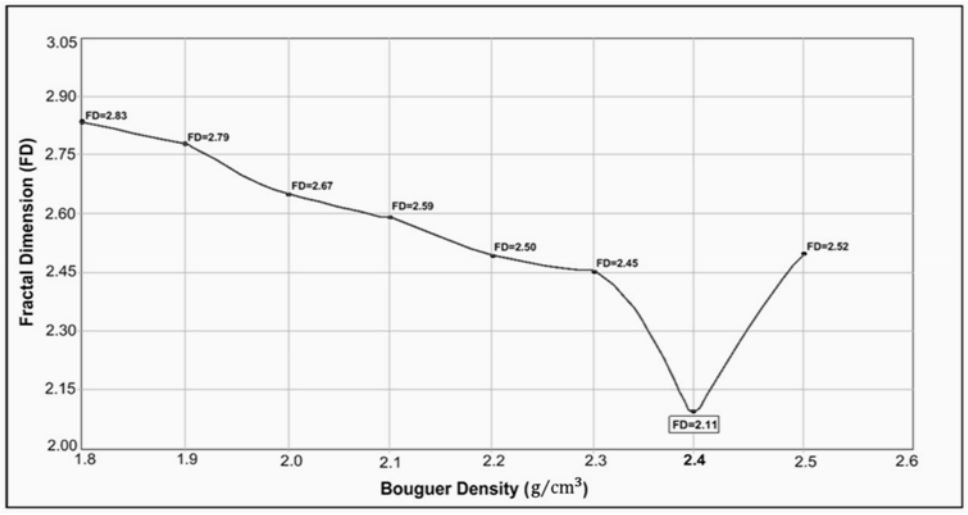


Figure (2): Complete regression line of bouguer anomaly of the area with fractal dimension (2.42)



Fig(3) Bouger anomaly vs. resulted fractally dimension from sedimentary formation

III

. RESULT AND DISCUSSION

Usage of small and large amount of bouguer density in the bouguer plate and topography correction makes extra effect of topography on the results of bouguer anomaly. Supposing that gravitational field has usually less roughness in comparison with topography, we determine bouguer density with minimizing surface roughness of bouguer anomaly. The amount of this roughness has been determined by dimension of surface fractal.

In the center inclined to the west in the contour map with density of 2.5 a special anomaly can be seen that is likely caused by Barund's fault performance of north east-south west which made formations break and move and made waterway in the valley that cannot be seen in the contour map with density of 2.1

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Asghar teymoorian. “Investigating natural topography on the exploration process case study.” International Journal of Engineering Research and Applications (IJERA), vol. 7, no. 8, 2017, pp. 01–03.