The gravity- and magnetic method as a tool determination of petroleum structures and fault zones

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The suggested method of combined analysis of gravity- and magnetic fields allows to recognize deep structures using either analytical or numerical models. Computation results have shown that at certain values of physical parameters of geological objects, such as excess density or masses's centers may be determined by combined transformant of this fields, named as a *D*-function, at the upper hemiplane levels. The prospecting drilling performed was a successfull one at the single drill-hole only as the oil-bearing marine carbonate horizons were found here and the oil influx of economic importance was obtained at the depth about 2.5 km located within positive structure within North-Surgut monoclinal fault Urengoy zone of the West Siberian basin.

The additional information was obtained by the calculation of *D*-function. The results were presented as the isolines of *D*-function values on the vertical cross-sections. The structural data obtained from the above mentioned drill-hole were used for the correlation of prognosed structural models. Petroleum structures into the region Urengoy Rift were identified by minimum values of *D*-function and by high gradient zones on the first three levels of upper hemiplane. The structures studied were separated by fault zone from another structure named Kolmogorskaja which is the biggest in the region. The data obtained under study evidence the usefullness of the proposed method of combined transformant calculation (i.e. *D*-function) for the modellind of oil-bearing structures and for the determination of sites for oil-productive drill-holes.