

Neutron petrophysical characteristics and their significance for simulation of correction charts with matrix effect

Ryšavý, F.¹

¹Karotáž a cementace, s.r.o., Velkomoravská 83, 695 00 Hodonín

Abstract

For an interpretation of the total porosity of sedimentary rocks by means of neutron logs it is important to eliminate the matrix effect which is caused by different chemical composition of the rock matrix and, especially, by different matrix density, as both factors significantly influence these logs. It can be done in an experimental way with the help of blocks of sedimentary rocks by modelling the function between neutron and total porosities. However, there is one condition: the blocks have to be of different porosity, but, their chemical composition and their matrix density should be approximately the same. It is very difficult to observe this condition. This explains why the correction charts of various associations are different. An application of mathematical simulation is assumed. This process enables us to strictly observe the conditions of both the identical chemical composition and the identical matrix density for all blocks; furthermore, it offers any number of point-pairs of neutron and total porosities, and we can utilize, for an interpretation, either chemically pure rocks, if there is no petrophysical analysis, or real rocks with real and detailed analysis of the neutron petrophysical characteristics.

Well-logging in regional hydrogeology (Example: the Police Basin)

Kobr, M.¹ and Krásný, J.¹

¹Institute of Hydrogeology, Engineering Geology and Applied Geophysics, Faculty of Sciences, Charles University, Albertov 6, 128 43 Praha 2

Abstract

Re-evaluation of all available well-logging data from the Police Basin (33 wells) yielded real data for a hydrogeological model of this basin (Fig. 1). The hydrogeological bodies (Fig. 2) and the petrographical composition of sediments in wells (Figs. 3 and 4 were defined, and groundwater flow in each well and in the whole basin was mapped (Figs. 5a and 5b). In this way the hydrogeological function of individual wells and of the whole region could be evaluated.

Gravimetric investigation of slope deformations

Bláha, P.¹, Mrlina, J.², and Nešvara, J.³

¹GEOtest Brno, a.s., 28. října 287, 709 00 Ostrava

²Geophysical Institute AS ČR, Boční II 1401, 141 31 Praha 4

³Nešvara IGGT, 28. října 287, 709 00 Ostrava

Abstract

The possibilities of application of gravimetric methods at investigation of slope deformations are discussed in this paper. Attention is paid to the following cases:

1) One-off gravimetric survey of landslide areas aimed at description of the deformation, definition of particular blocks and zones under tensile stress and quantitative modelling of the whole structure;

2) Repeated measurements focused on recording temporal changes of gravity, which are related to the rock volume density variations due to the dynamic propagation of the deformation process.

In both cases gravimetry provides an effective contribution to the description of the structures and their dynamic control over time.

Applications of thermal NOAA-satellite images in bedrock and soil research, Northern Finland

Taarma, H.¹, Aarnisalo, J.², and Hyvonen, E.³

¹Jaakonkuja 1 F 6, Oulu, Finland

²Outokumpu Metals & Resources OY, P.O. Box 143, FIN-02201 Espoo, Finland

³Geological Survey of Finland, Regional Office, P.O.Box 77, FIN-96101, Finland

Abstract

Satellite images taken during cloudless periods have been used to study geological macrostructures in Finland since the mid 1960's. The availability of digital data prompted more detailed interpretations, which are dealt with in this preliminary study.

Weather conditions in the spring of 1992 were advantageous for interpreting NOAA images. At that time it was possible to obtain the images just before dawn, when thermal capacity contrasts are emphasised, e.g. in Finland's bodies of water and swampy terrain. Utilisation of all the NOAA data channels brought forth both new and previously known lineaments and their intersecting regions. They have particular significance in the search for alkaline rocks and kimberlites in northern Finland. With the help of the data it was determined that weather satellite images and their derivatives may also be used in forest management, environmental study, agrigeological and certain Quaternary geological applications. As the thermal remote sensing has been exploited only to minor extent in Finland, the more detailed future studies should focus the latest technology especially on this area of satellite remote sensing.
