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Refraction seismics in vertical gradient medium The present state and future requirements.

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Abstract

Owing to the common process of weathering, from the physical point of view, the upper part of a rock massif represents a gradient medium. This contribution describes briefly the present state of interpretation including the influence of inner in-homogeneities on the measured data. The effect of some of them can be minimized by proper data evaluation, while the others can be only recognized and excluded from interpretation.

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Quantitative seismotectonic analysis of the Bohemian Massif, Czech Republic

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Abstract

Application of a geographical information system allows tectonic faults distribution and the azimuthal fault orientations to be statistically investigated. A comparison of the dominant fault orientations with an earthquake pattern of the area contributes to an explanation and assessment of seismogenetic potentials of individual fault systems. The approach has been tested on selected parts of the Bohemian Massif. Previous seismo-tectonic analyses (Schenk et al, 1986,1989,1996; Grunthal et al, 1990; Schenk and Schenková, 1996) indicate that main tectonic faults of the northeastern marginal tectonic zones of the Bohemian Massif display sinistral movements and, on the contrary, the dominant faults in the southwestern marginal area of the Massif display dextral movements. The main result of the presented procedure can be summarized into the following statement: considering that the Alps and the Carpathians still "push" against the resistant Bohemian Massif, a relative advance of its adjacent rock masses towards the north-west has to exist. The verifications of the above mentioned geodynamical tendencies are discussed.

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Contribution of geophysics to the neotectonics and kinematics of the West Carpathians

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Abstract

Late Alpine (Sarmatian-Quatemary) movements that gave the final shape to the West Carpathian part of the Alpine mountain range were studied in detail with the aim of compiling the neotectonic map and later a seismotectonic map. The neotectonic map of the West Carpathians, showing the Late Alpine movements in the period Sarmatian-Quatemary, was compiled according to the ESC work group instructions based on the multidisciplinary approach.

Besides the traditionally used geological and geomorphologic data, emphasis was laid on geodetic, seismological and mainly geophysical data.

All available geo-data (geological, geodetic, geophysical, geomorphologic) have been verified and unified on the basis of Remote Sensing. A model of the West Carpathian neotectonic blocks and a model of recent lithosphere are presented and the principal problems of the tectogenesis in the West Carpathians are defined: the different and ambiguous interpretations of the structure, the different criteria for modelling the tectogenesis, the relations between Late Alpine active faults, and relations between the Late Alpine faults and older tectonic systems, and especially the possibility of determining the position of such a problematic unit, as the Penninicum is on the basis of geophysical data.

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Application of the drilling variant of the method of pulse electromagnetic emission for assessment and monitoring of slope deformations

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Abstract

Applications of the drilling variant of a new, progressive method for solving engineering-geological and technical problems, mainly related to slope stability – the Method of Pulse Emission (PEE) are demonstrated on examples. Namely the results of measurements in holes: PB-2 (site Plevník), JM-6 and JM-20 (site Žilina-Dubeň), JM-9, JM-18, JM-19, (site Dolná Mičiná), JV-36 (site Veterná Poruba) and J-12 (site Vištuk) are discussed. All these results demonstrate the effectivity of the Method of Pulse Emission (PEE).

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Structural profile through the Brno Massif

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Abstract

The Brno massif is a Cadomian magmatic body which was incorporated into the structures of the eastern margin of the Bohemian Massif during the Variscan orogeny. Its geological structure was subsequently influenced by tectonic movements connected with Alpine orogeny. This tectonic evolution of the Brno Massif can be relatively well studied using small scale structures. The Cadomian structures are mostly preserved in wall rocks of granodiorites. The East and West granodiorite areas representing slightly different magmatic parts of the Brno massif were brought near along the Metabasite zone during the Variscan orogeny. East vergent thrusting in the first stage was strongly reworked by a sinistral strike slip in the second stage. Devonian sediments were incorporated into the structure of the Brno massif. The Alpine orogeny is responsible for the developing of local east vergent post-Cretaceous thrusts and extensional structures filled with Neogene sediments.

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Geophysical methods in exploration and decontamination of oil-polluted areas

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Abstract

Applications of geophysical methods in exploration and decontamination of oil-polluted areas are demonstrated on examples, namely in the area of the firm JIKOV České Budějovice in order to get in adverse surface conditions, information about the lithological character of the rock environment down to approx. 10 m with the view of tracing the continuities of insulating clays and mapping the deformation lines and zones which can be the preferential migration ways of massive contamination into the adjacent waterway. Another example discussed in this contribution is the geophysical survey in the area of the railway station Vysoké Mýto, where the main task was to determine the extent of oil contamination of the rock environment and water in the railway station, and to detect the sources of contamination. The results demonstrate the efficiency of geophysical methods in exploration and decontamination of oil-polluted areas.