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Derivation of the gamma ray exposure velocity of the ring standard on the tube detector

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Abstract

The gamma-ray point source technique is still used for calibration of Gamma-Ray Log. It requires large distances between source and detector so that the dimensions of the detector and the source could be neglected. As the course of the calibration-curve is non-linear, several distances are needed to draw the curve. However, the large distances require hard and strong gamma-ray sources, which mean a higher risk of irradiation.

A new method of Gamma-Ray Log calibration is proposed, where the standard is not ^{226}Ra, but ^{238}U having a softer radiation, and the standard is in the form of a ring. It is a cylindrical geometry where the detector is in the axis of the ring, in its centroid at best. The cylinder with uranium ring is shielded against inner and outer radiation and the radiation of the ring can be colimated inwards, too. Because the ring standard is an outer standard we have to calculate its exposure velocity – and that is the aim of this paper. Another objective of the present paper is deduction of the correction of scattered radiation, and a shielded standard for calibration of portable tools is proposed.

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Seismicity in the area of Western Bohemia

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Abstract

Institute of Physics of the Earth has been acquiring data in Western Bohemia since April 1991. The purpose of measurements is to identify on the basis of their manifestation the active tectonic lines. The data is acquired through the digital recording of the selected parts of the signal. More then 2000 microearthquakes have been recognized here in the period from April 1991 to 1996. These concentrated in seven areas. The Nový Kostel area has been studied in detail. The configuration of epicentres located in this area seems to indicate the presence of some tectonic lines. The relatively strong earthquakes in the discussed region made it possible to calculate their focal mechanism. An attempt to compute the stress field was made on the basis of computed focal mechanism.

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Earthquakes on the eastern margin of the Bohemian Massif recorded by the stations of the IPE Brno

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Abstract

The latest results of the seismological analysis in the eastern margin of the Bohemian Massif are discussed. The stations of the Institute of Physics of the Earth (IPE) have detected in this region 131 tectonic microearthquakes since 1992. Twenty tectonic events were localised by program HYPO3D. The localisations of epicentres indicate affinity of the seismo-tectonic activity mainly to the NW–SE trending movements along the faults.

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Vertical movements along the main faults in the East-Sudetic region

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Abstract

The Paleozoic of the eastern Silesicum in the Nízký Jeseník Mts. represents the upper level of the Cadomian North Moravian block (Brunovistulicum). The faults limiting the Nízký Jeseník Mts. area (see Fig. 1) are accompanied by a distinctive gradient of gravity. The vertical movements along the main faults are documented by structural boreholes.

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Diagenesis, magnetic overprint and tectonics near mokrá (E of Brno)

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Abstract

The color alteration index (CAI) for conodonts indicates a notable difference between shallow and deep Variscan burial conditions in southern and central part of the Moravian Karst, respectively. An analysis of the structures in question shows that at maximum depths in the middle of the Carboniferous the Mokrá Devonian must have been in a huge column of Culm (flysch) nappes where, as in each compression crust thickening with prevailing sedimentary units, rather low thermal gradients can be expected. A distinctive crystallization and magnetic overprint in carbonate rocks is not related with orogenic deformation as it was formerly assumed, but is evidently post-orogenic. It corresponds with isostatic Carboniferous/Permian cropping of rocks from greater depths to shallow layers (in our case of the partial Mokrá-Horákov nappes). This assumption is confirmed by the B-component of remanent magnetization of rocks, common for various localities within orogen. It corresponds to the diagenetic and magnetic overprint at the time when Variscan orogenic deformations ceased to generate differences in movement of slices or rock blocks.

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Distances between the early/middle devonian Gondwana and Laurussia; faunal and spore dispersals as compared with paleomagnetic data on paleolatitudes

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Abstract

Reinvestigation of Early/Middle Devonian benthic faunas (namely corals) shows that the northern and middle migration routes in the seas separating Gondwana and Laurussia were mostly oriented toward the southwest. The faunal domains involved cannot be grouped transversally. They must be regarded as finger-like canalized dispersions, which projected from their original sources in the Ural Ocean. However, the tectonically segmented relicts of Devonian sediments southwest of Prague yield a very typical Ibermaghian fauna, which documents a continuity between many peri-Gondwanan basins, e.g. in Algeria, Morocco, France (Montagne Noire, Armorican Massif), Spain (Cantabria) and Czechia (Barrandian). This "African" character of marine benthic fauna in the Barrandian strongly contrasts with abundance of plant spores connected to Ardenne/Rhenish/Moravian assemblages. These assemblages correspond to hot tropicals to subtropicals of southern latitudes and differ from both circumequatorial and cold temperate assemblages. It indicates a significant land barrier close to Laurussia, sharply limiting the transversal dispersal of the Ibermaghian marine organisms toward the northwest and being responsible for massive overlap of the Ardenne/ Rhenish/ Moravian spores toward the south-southeast. These faunal-floral relationships constrain any upper estimates of the Early/Middle Devonian distances between the north-Gondwanan and south-Laurussian margins where there is no place for several thousands of kilometers of oceans. The paleogeographic model with moderate transversal distances of several hundreds of kilometers corresponds to the paleomagnetically derived latitudes for the Early/Middle Devonian of the Barrandian and Moravian areas. These two areas differ in tectonic setting, but do not substantially differ in paleolatitudes, fluctuating within an interval of 10 to 20 degrees south.