



Intrasudetic Basin (Czech Republic) – a Complex Regional Geodynamical Study

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The Intra-Sudetic Basin is situated on the territory of the Czech Republic and Poland. Geologically it is a separate structural unit amidst the metamorphic complexes of the marginal part of Bohemian Massif, which is one of the most prominent Central European variscan structures. The position of the basin in a relatively mobile zone of the Bohemian Massif, caused that it was developing and filled with sediments during the whole variscan tectogenesis. Structurally, the basin is a complicated brachysyncline, which is bounded in the south-west by the Hronov-Porici fault zone. The fault zone is approximately 50 km long and it extends in the NW – SE direction. Relatively frequent local seismic activity is the proof of its present-day mobility. The strongest earthquake in 1901 reaches the magnitude $M=4.6$. The other significant feature denoting the increased endogenic dynamics of the region, is the presence of acidulous waters. The mantle derived carbon dioxide discharge occurs at the deep seated Kozakov-Hronov fault zone and at the Hronov-Porici fault zone.

Western part of the Intrasudetic Basin, adjacent to the Hronov-Porici fault zone represents an excellent model area for studying earth's crust dynamics of Central European variscan structures. At present there are carried out monitoring activities focused on observing of slope movements and tectonic movements along principal faults (GPS networks). The main aim of our project is the better understanding of seismic regime at the Hronov-Porici fault zone and the determination of local seismicity effects on groundwater regime. The knowledge of the seismic regime at the Hronov-Porici fault zone is relatively poor. This was shown in 2003, when a swarm of 15 events was recorded from 2 to 5 December. Occurrence of such swarms hasn't been documented so far.

Local seismicity monitoring is realized using a special small-aperture array. The array comprises four seismometers – the three are situated at the corners of equiangular triangle of approximately 100 m side length, the fourth sensor – reference station is situated in the middle of the triangle. The groundwater regime parameters are observed at wells and mineral springs by using standard instrumental equipment with high sampling frequency in order of minutes. Monitored parameters are groundwater levels and temperature in wells and CO₂ concentration in mineral water spring. The main disturbing factors – air pressure changes and effects of tidal forces are quantified in order to separate their effects on groundwater regime from the effects of seismicity.