



Quantitative geomorphologic data of the reactivated variscan Hluboká fault system (Budějovice Basin, southern Bohemian Massif)

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The NW-SE and NNE-SSW striking Hluboká-Rudolfov-Fault System in southern Bohemia is a potentially active late Variscan fault. It was repeatedly activated in Mesozoic, Miocene and Pliocene times and forms a „disputed seismic source“ in the vicinity of the nuclear power plant of Temelin. The Fault System at the NE and SE margin of the Budějovice Basin with its up to 340 m thick Cretaceous to Neogene sediments overlaying the hanging wall of the Fault System is partly characterized by a prominent linear morphological scarp.

Geomorphologic analysis mainly focus on mountain fronts at the basin margin crossing the Hluboká and Rudolfov fault as well as on the NE facing slope of the Racice Mountain which is not crossing the fault. Analyses use morphological parameters of small ephemeric tributaries of the Vltava River, which are all similar with respect to their catchments, hydrological conditions and location in crystalline basement rocks. Morphological differences in valley shapes are therefore likely to result from different amounts of uplift of the catchments with respect to the Vltava River. All parameters were measured from a 10 m resolution DEM and digital topographic maps 1:10,000. Additional field measurements were made at locations where the resolution of the digital data is insufficient.

Data show extremely low mountain-front-sinuosity of the hillslope forming the footwall of the Hluboká Fault characterizing a very straight mountain front at the fault and an uplift influenced morphology. Almost all values differ significantly from those observed at the other mountain slopes. The results are in line with the evidence obtained from mountain sinuosity. The mountain slope at the faults show deep and narrow V-shaped valleys with streams that are actively incising probably responding to continuous uplift. Vf (Valley-Floor-Width-to-Height) and SL (Stream Length) values are generally lower than those from drainages not crossing the fault. Convex-up thalweg sections of this slope show marked single large knickpoints close to the fault. The creeks off the fault generally show simple concave-up profiles.

In conclusion, the quantitative geomorphologic data consistently indicate that the crystalline massif in the footwall of the Hluboká and Rudolfov Fault System is actively uplifting with respect to the Budějovice Basin in the hangingwall of the fault system.