

Horizontal Strain Field of the Bohemian Massif Determined from GPS Measurements

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ABSTRACT:

Permanent GNSS and campaign GPS data monitored on several geodynamic networks located in the territory of the Bohemian Massif, Central Europe, allowed site movements to be determined. To constrain the first image of regional strain field for this territory a 2-D numerical modeling based on the theory of continuum mechanics under an assumption of homogeneity of the area was applied and site movements, i.e. displacement vectors, were taken as calculation inputs. This approach represents a purely geometric solution. Further attention was paid to influences of regional geological discontinuities of the Massif, by means of an evaluation of their mechanical decoupling along major faults and/or fault zones that play an important role in the distribution of the regional and local motions and stress patterns. The particular analysis of the behavior of tectonic zones in the Bohemian Massif was performed. Fundamental source of the mobility of these zones depends directly on sizes and directions of existing northward movements of structural blocks of the Alpine orogenic system. It was found that common horizontal strain field of the Bohemian Massif displays significant E-W extensions in the eastern and western parts of the Massif and mild N-S compressions in its central part. Additional analyses of the strain field pattern and its numerical uncertainties will be discussed from the viewpoint of data processing and knowledge of geological structures.