

Crustal Deformations in the Seismoactive West Bohemian Area, Central Europe. Case Study: Pre-, Co- and Post-Seismic Deformation Modeling Based on GPS Data

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ABSTRACT:

The West Bohemian area, situated in Central Europe, has been affected by volcanic activity since Miocene and its present magmatic intra-plate activity is linked with geodynamic mobility of the territory and origin of earthquake swarms. The GPS campaigns realized before, during and after the October 2008 swarm allowed crustal deformations in the pre-, co- and post-seismic phases to be detected and modeled. Qualitative investigations of monitored surface deformations, tectonic explanations of the monitored movements and quantitative tectonic modeling are presented together with information on morphotectonic, geoelectric and geochemical surveys related to these deformations. The quantitative movement modeling takes into account changes in fault behaviors through time caused by stress accumulation, stress release, crustal relaxation, and rock environment recovery. Conditions of energy release and medium balance are discussed in terms of earthquake swarm phases and their relation to strain variations. Finally, a geodynamic pattern of the West Bohemian area with improved seismotectonic model will be delivered.