



## **Integration of permanent and periodic GPS/GNSS measurements for local and regional geodynamic research in the area of the Polish-Czech Network SUDETEN**

Bernard Kontny (1), Jan Kaplon (1), Vladimir Schenk (2), Zdenka Schenkova (2), and Janusz Badura (3)

(1) Wrocław University of Environmental and Life Sciences, Institute of Geodesy and Geoinformatics, Wrocław, Poland (bernard.kontny@up.wroc.pl), (2) Institute of Rock Structure and Mechanics of the AS CR, Prague, Czech Republic, (3) Polish Geological Institute, National Research Institute, Lower Silesian Branch, Wrocław, Poland

Since 1997 all current local geodynamic studies in the area of the Polish and Czech parts of the Sudeten and the Sudetic Foreland have been associated with annual periodic GPS campaigns, epoch measurements. The most epochs consisted of more than twelve observation hours and some of them kept on two or three 24-hour observations. Experience collected by international research teams carrying out geodynamic researches with the GPS technique in seismically active areas (USA, Japan) proved that more information can give permanent measurements. However, the Sudeten area, regarded as an area of the weak tectonic activity, can be hardly covered with the dense network of GNSS stations from economic reasons. Hence rational using of existing permanent GPS stations located in studied area and in its vicinity detects the coordinate changes that cannot be appointed from periodic campaign data and that, on the other hand, have rather regional than local character. Creating the spatial models of irregularities of the continuous signals should improve results of the epoch measurements. From this viewpoint, in this project authors used measurement data of chosen permanent GPS stations located in the area: the EPN stations, ASG-EUPOS stations, GEONAS stations and all epoch observations. These data were gained as part of research projects carried out within 1997-2009 period, as well as during new supplementing campaigns realized in the frame of the project N526278940 in the 2011 and 2012 years. Reprocessing of all the permanent and epoch data performed by the latest version of Bernese GNSS Software (V5.2) was performed using EPN guidelines for the processing, reference frame realization and the usage of physical models (atmosphere, Earth rotation, etc.). Standardized results of processing the aggregated GPS network, including permanent stations and all local networks on the area of research, serve for conducting new geodynamic interpretation. Further parameters that estimate the linear model of position changes of test point coordinates based on results of the permanent and epoch observations had been performed. Then, applying linear site velocities, the surface deformation model for the Sudeten area was compiled. Results of this research constitute the base both for recognizing tectonic impacts to the area and for potential hazard assessments.

This research had been granted by the Polish National Science Centre, project No. N526 278940, and accomplished in cooperation of specialists from the Institute of Geodesy and Geoinformatics, Wrocław University of Environmental and Life Sciences, the Institute of Rock Structure and Mechanics of the Czech Academy of Sciences in Prague and the Polish State Geological Institute, Lower Silesia Branch in Wrocław.