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Geodynamic Network in the West Bohemia - Results of Campaign-style GPS Data Processing Using Trimble Total Control Software

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The results of GPS measurements are significantly affected by the quality of GPS data and the style of data processing. The data processing style is primarily predetermined by the type of used GPS software and subsequently by its process settings.

This paper presents the processing possibilities and the results obtained with Trimble Total Control GPS software. All used data are coming from the campaign-style GPS measurements performed in the geodynamic network Cheb in the West Bohemia seismoactive region in the period 1993 to 2004.

The local GPS network consists of 26 points with its centre located in the main epicentral area around the village Nový Kostel. The network is spreading on 1300 square kilometres with the longest baselines up to 40 kilometres. All network points are established by 5 meter long vertical steel pipe extending 1.5 m above the earth surface, filled up and fixated by concrete. The points provide compulsory centring of GPS antennas.

Two types of campaigns are performed. The annual main campaign is performed on all points of the network and it takes five days. The average total occupation time at one point is 10 hours. Not the same set of GPS equipment has to be used in case of repeated occupation. The 24-hours campaigns are performed irregularly throughout the year on selected four points located around the main seismoactive zone in the region. In this case the same sets of antenna and receiver are used anytime the points are measured.

Under these circumstances not worse that following accuracy characteristics were achieved in adjustment of data from any campaign: 5 mm 95% confidence maximum horizontal radius of point for main campaigns and 2 mm 95% confidence maximum horizontal radius of point for small campaigns. This accuracy enabled to conclude, that no long-term horizontal displacement trend exists in the region within the period of 10 years of observation. On the other hand, along the main tectonic zone some forward-reverse movements were indicated, corresponding with strike-slip component of fault plane solutions of local seismological events.