



Reliability of calculation of the lithosphere deformations in tectonically stable area of Poland based on the GPS measurements

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In this research we aimed to check if the GPS observations can be used for calculation of a reliable deformation pattern of the intracontinental lithosphere in seismically inactive areas, such as territory of Poland. For this purpose we have used data mainly from the ASG-EUPOS permanent network and the solutions developed by the MUT CAG team (Military University of Technology: Centre of Applied Geomatics). From the 128 analyzed stations almost 100 are mounted on buildings. Daily observations were processed in the Bernese 5.0 software and next the weekly solutions were used to determine the station velocities expressed in ETRF2000. The strain rates were determined for almost 200 triangles with GPS stations in their corners plotted used Delaunay triangulation. The obtained scattered directions of deformations and highly changeable values of strain rates point to insufficient antennas' stabilization as for geodynamical studies. In order to depict badly stabilized stations we carried out a benchmark test to show what might be the effect of one station drift on deformations in contacting triangles. Based on the benchmark results, from our network we have eliminated the stations which showed deformation pattern characteristic for instable station. After several rounds of strain rate calculations and eliminations of dubious points we have reduced the number of stations down to 60. The refined network revealed more consistent deformation pattern across Poland. Deformations compared with the recent stress field of the study area disclosed good correlation in some places and significant discrepancies in the others, which will be the subject of future research.