



Horizontal deformations the of earth surface of Antarctic peninsula using results of GPS-observations

J. Golubinka (1), L. Babiy (1), V. Litvinov (2), G. Minilevskiy (2), K. Tretyak (1)

(1) National University "Lvivska Politechnika", Lviv, Ukraine, (2) Ukrainian Antarctic center, Kiev, Ukraine (kornel@polynet.lviv.ua / Fax: +38 0322 74 43 00 / Phone: +38 0322 980748)

The results of GPS- Campaigns which are annually implemented beginning from 1995 under the aegis of the SCAR (Epoch Crustal Movement Campaigns) serve as initial data for creation of maps of deformations rate of the earth surface of Antarctic peninsula. This network is based on 15 points covering northern-western part of Antarctic peninsula and contiguous islands. The horizontal displacements of permanent stations OHIG and PALM are determined in the system ITRF-2000. Despite of these data there were included for processing the results of periodical GPS-measurements implemented on the point VER1 in 2002-2003 on the Antarctic station "Academic Vernadsky" where the geodynamic polygon consisted of 8 geodetic points has been created. Referencing of the polygon and the point VER1 was implemented relatively to the network of nearest permanent stations AUTF, OHIG, PALM, VESL, AMUN, MCM0. Maps of horizontal deformation rates of the earth surface of Antarctic peninsula were created and annual changes of deformation parameters (relative shift γ_1, γ_2 on axes X,Y; γ – general shift which characterizes inhomogeneity of horizontal shift of deformed area; dilation Δ – relative expansion and compression of territory area, relative rotation of separate structure of territory ω have been calculated in result of combined processing of initial data using the method of finite elements. Values of rates of general shift γ are in boundaries $(+8,9 \cdot 10^{-8} \div +1,0 \cdot 10^{-7} \text{ 1/year})$; dilation Δ - $(-9,2 \cdot 10^{-9} \div -1,4 \cdot 10^{-6} \text{ 1/year})$; relative rotation ω - $(4,4 \cdot 10^{-11} \div 4,1 \cdot 10^{-7} \text{ rad/year})$. Quantitative values of deformation parameters of territory of Antarctic peninsula according to intensiveness are corresponded to region with delayed tectonic activity but negative values of dilatation indicate about continuous irregular contraction of territory and its extreme values are corresponded to the zones of tectonic breaks occurrence.