Geophysical Research Abstracts, Vol. 8, 07503, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07503

Neogene and Recent lithosphere “folding” on the East European Craton?

S. Sliaupa (1), R. Stephenson (2)

(1) Institute of Geology and Geography Lithuania, (2) Vrije Universiteit Amsterdam, (sliaupa@geo.lt / Phone: +370-5-2104698)

Lithospheric plates are subject to horizontal stresses that lead to different scales of tectonic deformations. Lithospheric “buckling” has been described in a number of analytical, analogue, and numerical models. However, natural analogues, with the possible exception of a few examples mainly related to oceanic regions, commonly have rather obscure and ambiguous features. A distinct long-wavelength pattern of the inferred Neogene and Recent vertical movements, superimposed on structures having different scales, was proposed for the East Eurpean Craton in the Russian-language literature in the 1980s. The wavelength of these undulations is about 700 km. Neogene structures are orientated NW-SW, inferred amplitudes are in the range of -70 to +100 m (e.g. Brest and Smolensk uplifts, Minsk-Kiev and Moscow depressions). What are inferred as Recent structures are discordant to the older ones, being directed NNE-SSW, with vertical displacement rates in the range -2.5 mm/yr to +1.5 mm/yr. The reorientation of the trends of these structures during the Neogene and Recent stages implies a changing stress regime, therefore related to processes at plate margins. The very long wavelength of the undulations suggests a strong coupling of the crustal and mantle lithosphere, which is typical for old strong cratons. There is also an absence of any correlation with underlying (older) tectonic grain. In this contribution, we try to assess the data on which the proposed long wavelength undulatory patterns have been proposed and discuss the pros and cons of various existing models for intraplate deformation that could be relevant to their origin. Such models include “lithosphere buckling”, often postulated in the context of intraplate deformations in western Europe. In particular, we make an attempt to define ways of testing this hypothesis (and others) using the East European Craton data.