Geophysical Research Abstracts
Vol. 15, EGU2013-8733, 2013
EGU General Assembly 2013

Comparative analysis of geodynamic activity of the Caucasian and Eastern Mediterranean segments of the Alpine-Himalayan convergence zone

Tamaz Chelidze (1) and Lev Eppelbaum (2)

(1) M. Nodia Institute of Geophysics, Tbilisi, Georgia (tamaz.chelidze@gmail.com), (2) Tel Aviv University, Faculty of Exact Sciences, Dept. of Geophysical, Atmospheric and Planetary Sciences, Tel Aviv, Israel (levap@post.tau.ac.il)

The Alpine-Himalayan convergence zone (*AHCZ*) underwent recent transverse shortening under the effect of collisional compression. The process was accompanied by rotation of separate microplates. The Caucasian and Eastern Mediterranean regions are segments of the of the *AHCZ* and are characterized by intensive endogenous and exogenous geodynamic processes, which manifest themselves in occurrence of powerful (with magnitude of 8-9) earthquakes accompanied by development of secondary catastrophic processes. Large landslides, rock falls, avalanches, mud flows, etc. cause human deaths and great material losses. The development of the aforesaid endogenous processes is set forth by peculiarities of the deep structure of the region and an impact of deep geological processes.

The Caucasus is divided into several main tectonic terranes: platform (sub-platform, quasi-platform) and fold-thrust units. Existing data enable to perform a division of the Caucasian region into two large-scale geological provinces: southern Tethyan and northern Tethyan located to the south of and to the north of the Lesser Caucasian ophiolite suture, respectively. The recent investigations show that the assessments of the seismic hazard in these regions are not quite correct – for example in the West Caucasus the seismic hazard can be significantly underestimated, which affects the corresponding risk assessments. Integrated analysis of gravity, magnetic, seismic and thermal data enables to refine the assessment of the seismic hazard of the region, taking into account real rates of the geodynamic movements. Important role play the last rheological constructions. According to Reilinger et al. (2006) tectonic scheme, the West flanking of the Arabian Plate manifests strike-slip motion, when the East Caucasian block is converging and shortening.

The Eastern Mediterranean is a tectonically complex region located in the midst of the progressive Afro-Eurasian collision. The recent increasing geotectonic activity in this region highlights the need for combined analysis of seismo-neotectonic signatures. For this purpose, this article presents the key features of the tectonic zonation of the Eastern Mediterranean. Map of derivatives of the gravity field retracked from the Geosat satellite and novel map of the Moho discontinuity illustrate the most important tectonic features of the region. The Post-Jurassic map of the deformation of surface leveling reflects the modern tectonic stage of Eastern Mediterranean evolution. The developed tectono-geophysical zonation map integrates the potential geophysical field analysis and seismic section utilization, as well as tectonic-structural, paleogeographical and facial analyses. Tectonically the map agrees with the earlier model of continental accretion (Ben-Avraham and Ginzburg, 1990). Overlaying the seismicity map of the Eastern Mediterranean tectonic region (for the period between 1900 and 2012) on the tectonic zonation chart reveals the key features of the seismo-neotectonic pattern of the Eastern Mediterranean. The results have important implications for tectonic-seismological analysis in this region (Eppelbaum and Katz, 2012).

A difference in the geotectonic patterns makes interesting comparison of geodynamic activity and seismic hazard of the Caucasian and Eastern Mediterranean segments of the *AHCZ*.