Geophysical Research Abstracts, Vol. 7, 05363, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05363

Coupling between foreland and backarc basins post-orogenic vertical movements: neotectonic deformations in the SE Carpathians - Transylvania basin corridor

L. Matenco (1), M. Tilita (1,2), S. Cloetingh (1) and C. Dinu (2)

(1) Netherlands Research School for Integrated Solid Earth Science, Faculty of Earth and Life Sciences, Vrije Universiteit, Amsterdam, The Netherlands, (2) University of Bucharest, Faculty of Geology and Geophysics, Bucharest, Romania, E-mail: liviu.matenco@falw.vu.nl

The Carpathians represent a key site for studying processes linked to lateral variations in continental collision mode, development of unusual foredeeps and relationship with opening and evolution of backarc basins, large scale post-collisional deformations and differential vertical motions along the orogen. The SE part of this highly arcuate orogen presents an adequate opportunity to study large scale Pliocene-Quaternary (neo)tectonic patterns associated mainly with significant differential vertical movements along, and across the orogen. In this context, intra-plate folding due to the Pliocene to Quaternary inversion of the locked Carpathians foreland and Transylvania basin system appears to play a more important role than hitherto assumed. Deformation is asymmetric, with larger wavelengths in the Carpathains foreland, the amplitude gradually decreasing towards the Apuseni Mountains. In the Carpathians foreland, along the entire sector of the East and South Carpathians where the Moesian platform is present in the foreland, the frontal part of the thin-skinned nappe pile is covered by post-collisional Uppermost Miocene to Quaternary deposits with up to 5 km thickness. Particularly large subsidence in the centre and large scale tilting on the western flank of the Focsani basin is just a Pliocene-Quaternary interference of a crustal folding mechanism with increased effects in this particular sector of the chain. Here, the inversion taking place at the end of the Pliocene has led to large scale vertical movements have, actively changing the shape of the basin, the overlying topography and the rivers network. This has led to exaggerated Pliocene-Quaternary sedimentologi-

cal features, as a direct result of the interplay between actively uplifting source areas, mass transport in the adjacent basins and possible climatic changes taking place at the beginning of the Quaternary. The amplitude of the subsidence in the Focsani basin area is furthermore exaggerated by the uplift in the neighbouring East-European/Scythian block, undergoing contrasting lithospheric folding. Towards the Carpathians hinterland, the amplitude of the vertical movements is gradually decreasing. The overall folding mechanism induced a Pliocene - Quaternary uplift, recorded in the Persani and Apuseni Mountains, and subsidence in the Brasov basin and, at a reduced scale, further to the west in the Transylvania basin. In the later, the Middle Miocene salt formation detaches in the post-Pannonian times the larger wavelength folding subsidence of the pre-Miocene basement from the very short, up to 20km shallow folds of the Middle - late Miocene sequence. The basin has recorded significant tilting movements, and near the South Apuseni Mountains, large scale NE-SW oriented thrusting took place, reactivating inherited Cretaceous-Eocene Transylvanides structures. The large scale differential Pliocene - Quaternary deformations depicted in the present study reflect the impact of the lithosphere to surface processes on the recent topography in post-collisional times. It represents also a prime example of the impact of inherited crustal and lithospheric structure on the recent evolution of continental intraplate areas.