



Three-dimensional crustal velocity map of a back-arc basin inversion and tectonic implications for the Alpine-Dinaric-Pannonian-Carpathian system

Gyula Grencz (1,2), Péter Farkas (1), Renáta Hevér (1), Zoltán Grácz (2), and László Tóth (2)

(1) Institute of Geodesy Cartography and Remote Sensing, Satellite Geodetic Observatory, Budapest, Hungary (grencz@sgo.fomi.hu), (2) Geodetic and Geophysical Institute, RCAES, HAS, Sopron, Hungary

Eurasia-Nubia collisional boundary comprises complex set of various microplates including Adria and Apulia. One of its remarkable features is located north of Adria over the East Alpine and Dinaric collision zone, the Carpathian Arc and the Pannonian Basin. The back-arc basin formation started around the early Miocene driven by slab pull, extrusion, and gravitational sliding. The arc is now enclosed by the European platform, and with the ongoing Adria convergence, the back-arc basin is being inverted. We have been studying present-day crustal kinematics from Adria to the European Platform in a regional collaboration using GPS for two decades. Inside the basin even more, almost a quarter of a century long, systematic GPS measurements are available. This network includes GPS sites exclusively for geodynamics having direct contact with the crust with short, brass, forced centered antenna set-up, established mostly in outcropping solid bedrock where available. The long and precise systematic data – with basically no equipment change, offsets- enabled us to compile the first three-dimensional crustal velocity map for this dryland back-arc basin with a couple of tens of a millimeter per year significance level. Based on these data sets some technical words are given about sites on loose sediments and the effect of monumentation at very low vertical signal level. However, our primary focus will be on constraining kinematics of this back-arc basin inversion investigating all major tectonic units of this system and their boundary zones. We also calculate strain distribution, and provide seismotectonic implications.