



## **Tectonic and sequence stratigraphic evolution of asymmetric extensional back-arc basins: seismic interpretations in the Pannonian Basin**

Attila Balázs (1,2), Liviu Matenco (2), Imre Magyar (3,4), Ferenc Horváth (1,5), and Sierd Cloetingh (2)

(1) Department of Geophysics and Space Sciences, Eötvös Loránd University, Budapest, Hungary (a.balazs@uu.nl), (2) Netherlands Research Centre for Integrated Solid Earth Science, Utrecht University, Faculty of Geosciences, Utrecht, Netherlands, (3) MOL Hungarian Oil and Gas Plc., Budapest, Hungary, (4) Research Group for Paleontology, Hungarian Academy of Sciences-Hungarian Natural History Museum-Eötvös University, Budapest, Hungary, (5) Geomega Geological Research and Environmental Services Ltd., Budapest, Hungary

The evolution of the Pannonian Basin is generally thought to be driven by subduction roll-back associated with mantle flow dynamics. The Miocene back-arc extension resulted in the formation of dominantly half-grabens in the hanging wall of low-angle detachments and listric normal faults, associated with coeval large-scale exhumation of their footwalls. To quantify the evolution of these asymmetric extensional structures, a novel kinematic and seismic sequence stratigraphic interpretation was performed. Based on reflection terminations and characteristic seismic facies we separated systems tracts of the half-graben deposits that formed as a result of interplay between subsidence, sedimentation and water-level variations. Lower order systems tracts were defined by separating rift initiation, rift climax, immediate post-rift and late post-rift systems tracts, while a higher order transgressive-regressive cyclicity and associated unconformities were locally identified in the syn-tectonic basin fill.

Connecting these observations demonstrates that extension migrated in time and space across the basin. Extension started during Early Miocene in the oldest sub-basins, while Middle Miocene rift climax is quite common in the entire study area. The youngest syn-tectonic strata were deposited during Late Miocene times in the eastern parts of the Pannonian Basin, for instance, in the Derecske, Makó and Szeged Troughs. The syn-rift/post-rift boundary cannot be interpreted as a discrete event in the entire basin system, because it is a progressive, process-related expression. The obtained results significantly improve the classic ideas of syn-rift/post-rift evolution of the Pannonian Basin.