

## **Structural Inheritance and Style within the Getic Depression, South Carpathians, Romania**

**Zsolt Schleder<sup>1</sup>, Alexandru Lăpădat<sup>4</sup>, Oscar Fernández<sup>2</sup>, Dan Tămas<sup>3</sup>, Alexandra Tămas<sup>3</sup>, Sorin Filipescu<sup>3</sup>, Csaba Krézsek<sup>4</sup>, Mihai Rădoias<sup>4</sup>, Mirela Vasiliu<sup>4</sup>**

<sup>1</sup>OMV Exploration & Production GmbH

<sup>2</sup>Vienna University

<sup>3</sup>Babes-Bolyai University

<sup>4</sup>OMV Petrom

### **Abstract**

The Carpathians are part of the Alpine orogen, and the Getic Depression (or Getic fold belt) is located to the south of the South Carpathian. Underthrust beneath the fold belt is the Moesian Platform lower plate. This foreland depocenter can reach a depth of up to 10 km and evolved in an oblique convergent setting from Uppermost Cretaceous-Paleogene and was shortened during the Badenian-Middle Sarmatian (middle to late Miocene, 14.9-10 Ma) and Pliocene to recent. Thus far, in previous publications, the role of the structural grain of the lower plate was poorly constrained. For the fold belt, contrasting interpretations implied a range of shortening magnitudes and contrasting fault pattern. This contribution shows seven balanced cross sections that rely on seismic reflection and well data. One section, just outside and to the south of the fold belt, gives insights into the fault network of the Moesian Platform. In that section we see 35 km of north westward directed normal sense extension that creates a set of rotated fault blocks. Growth strata within the half grabens attest to Permo- Lower Triassic extension age. The individual normal faults merge at depth into a common detachment that rises monotonously towards the east and forms a domal-shaped, arched detachment. This is the structural grain that we project down plunge towards the north beneath the fold belt. The interpreted six sections that lie in the tectonic transport direction show that structures in the western part of the Getic fold belt are compatible with the inversion on the underlying Permo-Lower Triassic extensional fault. Ubiquitous truncation of Oligocene strata by overlying units suggest inversion started during Late Oligocene (intra-Burdigalian). The Badenian-Sarmatian shortening further deforms the pre-existing contractional features and the shortening increases from 5 km on the west to at least 17 km on the east. NW-SE oriented transfer zones with normal faults separate the fold belt domains with diverging displacement vectors and eastward increasing shortening. Two main salt levels within the fold belts' sediment pile are laterally discontinuous hence they only have local significance in the deformation. The frontal part of the fold belt consists predominantly of Badenian-Sarmatian synkinematic units as the fold belt propagated into the foredeep units, this interpretation requires less shortening in the frontal structures compared to earlier solutions. Due to the lack of characteristic features on the studied sections, we infer that the Getic fold belt did not evolve as a transtensional depocenter during the lower Miocene as suggested by earlier publications.