Geophysical Research Abstracts
Vol. 18, EGU2016-6589, 2016
EGU General Assembly 2016

Large scale displacements and internal deformations of the Outer Western Carpathians during the Cenozoic as manifested in paleomagnetic rotations and in the magnetic fabrics

Emö Márton (1) and Antek K. Tokarski (2)

(1) Geological and Geophysical Institute of Hungary, Paleomagnetic Laboratory, Budapest, Hungary, (2) Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Cracow, Kraków, Poland

The paleomagnetic and magnetic anisotropy results interpreted in this presentation in terms of tectonics were obtained on the fine grained members, mostly mudstones/claystones, of the flysch from the Magura, the Silesian and the Dukla rootless nappes. The results are the best from the Upper Oligocene Krosno beds, which were affected by compression soon after deposition. These beds were available for sampling in the Silesian and Dukla nappes, but absent in the Magura nappe. Thus, in the latter older Paleogene strata were tested.

A common feature of all sampled sediments is the low susceptibility (in the range of 10^{-4} SI or lower), weak remanence and the presence of pyrite. AMS measurements point to quite strong and probably repeated deformation in the Magura nappe, and the remanence is of-post-folding age. The AMS of the Silesian and Dukla nappes indicate weaker deformation, the orientations of the AMS lineations reflect compression. The remanence is of pre-folding age in the western and central segments of the Silesian nappe and is a mixture of pre and post-folding magnetization in the eastern segment. All the so far mentioned areas must have been affected by about 60° CCW rotation which followed the internal deformation. The Dukla nappe also rotated in the CCW sense, but the angle is far from well-defined. This can be attributed to the complicated internal structure of the nappe (e.g. presence of olistoliths) and non-removable overprint magnetizations. The relationship between local tectonic strikes and AMS lineations seems to imply that the ductile deformation responsible for the AMS lineations were acquired first, and the map-scale structures came into being during the CCW rotation of the studied segment of the nappe.

AARM measurements documented that the fabrics of the ferrimagnetic minerals are often different from the orientation of the AMS fabrics. In such cases, they either fail to define an ellipsoid or the general orientations of the maxima are different from that of the AMS and the scatter is high. It is concluded that the AARM fabric is not really sensitive to weak tectonic deformation, while the AMS fabric is.

Acknowledgement: We thank Marta Rauch, Oldrich Kreijci and Daniel Kiss, our principal cooperation partners in different parts and times of our systematic studies in the Outer Western Carpathians. Financial support from OTKA project 105245 and Academy exchange program between Polish and Hungarian Academies are gratefully acknowledged.