

3D-flexular modelling of the West- and East Carpathian transition zone: problem description and preliminary results

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The transition zone between the West- and East-Carpathian mountain belt and foredeep are characterized by the change in strike from W–E to NW–SE. This change is probably controlled by the differential strength of the West- and East-European lithosphere and shape of the plate margins. Especially the role of the Russian Platform as fixed and rigid boundary is dominant. Furthermore, the transition zone is also characterized by widening of the foredeep in S.E. Poland. With 3D-modelling we analyse the flexural expression of the obliquely interacting subducting/underthrusting

processes acting on the West- and East-European lithosphere. We concentrate on the lateral variation in effective elastic thickness (e_{eff}) of the lithosphere. The weak zones, expressed in low e_{eff} -values, control the main flexural bending of the lithosphere and the stronger zones, expressed in the higher e_{eff} -values, are able to transfer the flexural intra-plate stresses. However, in order to explain the folded shape of the foredeep in S.E. Poland, passive interaction is not sufficient: we suggest possible NW continuation of the East-Carpathian system under the foredeep in S.E. Poland. In earlier studies of 3D kinematic reconstructions (Morley, Tectonics, 4, 1996), lateral space problems are documented for arc-shaped thrust belts. He notes that due to the divergence of the over-thrusting foreland extension may occur parallel to strike. These space problems do also exist for the under-thrusted/subducted European lithosphere, for which the plate boundaries converge and even overlap(?).