LATE-STAGE MOTION OF ADRIA, FRAGMENTATION OF THE PERIADRIATIC FAULT AND THE STRUCTURE OF THE CENTRAL EASTERN ALPS

NEUBAUER, Franz*; HEBERER, Bianca

University of Salzburg, Austria

Franz.Neubauer@sbg.ac.at

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In a new model, we explain the late-stage collisional structure of the Eastern Alps to record the effects of the mainly NNW-moving Adriatic microplate with frontal shortening along the ENE-trending Southalpine margin and NNW-directed indentation into sub-Tauern levels causing updoming of the Tauern window. Indenting Adria is confined by the transpressive NW-trending dextral NW-Dinaric-Möll Valley (DIMÖ) wrench corridor, and the NNE-trending transpressive Giudicarie fault in the west. No major change of motion direction of Adria is needed, therefore, to explain the observed structures. The location of the DIMÖ corridor has been potentially caused by lithological contrasts at lower crustal levels expressed by the SW-margin of the Pannonian fragment.

The new model allows explain the tectonic and surface structure of the central axis of the Eastern Alps. The units within the Tauern window change its strike from a dominant WSW-trend in the west to an ESE-trend in the east. The dominant WSW-trend is explained by the oblique NNW-directed indentation of Adria and the ESE-trend by clockwise rotation of the easternmost Tauern window, which is then cut by an E-W extension region.

The new model also explains the segmentation of the Periadriatic fault system (PAF) in the Eastern Alps. The mostly ESE-trending PAF, which is decorated by Oligocene tonalite lamellae, is transected by several faults, which are from west to east: (1) The sinistral, NNE-trending Giudicarie fault southerly adjacent thrust belt represent a transpressive zone. (2) The ca. 195 km long straight PAF is limited to the east by the dextral DIMÖ corridor (with ca. 4 – 6 km offset). (3) To the east, a positive flower structure straddles the PAF and the North Karawanken unit was transported over the intra-orogenic flexural Sarmatian-Pliocene Klagenfurt basin, which is cut by the dextral Lavant fault (ca. 10 – 15 km displacement). (4) East of the Lavant fault, the PAF juxtaposes the Pohorje basement in the north and the Sava fold area in the south shortened during Middle and Late Miocene times.

In this model, the location of the updomed Tauern window is the result of Adriatic indentation limited to the east by the DIMÖ wrench corridor.