Middle Jurassic subduction-related volcanism and Cretaceous kinematics in Meliata units of the eastern Northern Calcareous Alps

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A sedimentological and structural study has been carried out on Meliata units of the eastern Northern Calcareous Alps (NCA). There, the Meliata units there comprise Middle/Late Triassic pelagic limestone and radiolarite, and the Doggerian Florianikogel Fm. with dark shale/slate and sandstones where the earlier formations are interpreted to represent olistolites within the Florianikogel Fm. (Mandl and Ondreijickova, 1991; Kozur and Mostler, 1992). Own field lithostratigraphic and structural investigations suggest that the Middle/Triassic and Doggerian formations represent a continuous sequence that is overlain by another tectonic unit with mainly greyish to colored pelagic limestones. The Florianikogel Fm. represents the well-preserved, finely laminated sequence with dark slate, cm-thick feldspar-rich tuffaceous layers, and several cm-thick, volcaogenic graywacke layers. Modal (using the Gazzi-Dickinson approach) and geochemical compositions (major, minor and trace elements following Bhatia & Crook, 1986) suggests a deposition of these graywackes in a arc-related geodynamic setting. Both the graywacke composition and the presence of tuffaceous layers indicate, therefore, provided correct biostratigraphy, the presence of a distal volcanic arc setting in an anoxic sedimentary basin in the Meliata ocean.

The thrusting of Meliata units onto the proximal Tirolic passive continental margin sequences of the NCA occurred under very low grade to low grade metamorphic conditions during pre-Gosau shortening and nappe stacking. Kinematic indicators display, similar to all underlying Austro-Alpine units, a top WNW emplacement of Meliata units under semi-ductile to ductile tectonic conditions. In portions, ductile fabrics were annealed (e.g. within a basal calcite marble), in hangingwall units overprinted by top-SE extensional fabrics.

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P- and S-wave tomography of the Vrancea seismogenic zone

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A set of 2782 P- and 2615 S-wave arrival times from 319 local earthquakes recorded at least at 7 stations were simultaneously inverted for 3-D P- and S-wave block velocity structures, hypocentral parameters and station corrections. The block dimension was 30 km x 30 km horizontally and the layer boundaries were at 20, 40, 60, 80, 100, 120, 150 and 180 km depth. A number of 248 blocks were modelled. The overall reduction in residual variance was 32%, leaving 0.46 s unexplained, mostly due the errors in S-wave picking. In the crustal domain, the results confirm the high velocities directly under the Carpathians and the low velocities in the foredeep region. In the subcrustal domain, the results confirm the seismic gap between 40 and 60 km depth, as well as the very narrow vertical region oriented SW-NE, with maximum 15 km in the SE-NW direction, containing the intermediate depth earthquake foci. There is a tendency of the foci between 60 and 150 km depth to lie in low velocity regions (v_P = 7.5-7.7 km/s). We tentatively explained the presence of these velocities in that depth range by a basalt to eclogit phase transition in the subducted oceanic crust. The foci lie in zones with $v_P/v_S \geq 1.7$ in the crust and between 1.6-1.7 below the depth of 60 km. Higher subcrustal velocities are found in NE (East European Platform) or in NW (Transylvanian Basin) in comparison with the southern regions belonging to the Moesian Platform.

Timing of basement reactivation in the Inner Western Carpathians

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Fault systems formed in the Austroalpine basement of the Inner Western Carpathians during Triassic-Jurassic rifting have been reactivated several times in a variety of tectonic regimes and metamorphic environments. The complex events recorded in the fault rocks of these systems have been locally obscured by overprinting, but the integration of structural data and the pattern of sediment deposition on a regional scale has helped to resolve local complexities into a regionally consistent model. The aim of this presentation is to discuss the significance of the observed repeated selective exploitation of ancient fractures and to