The Pre-Alpine history is characterised by a polyphased Permian (from 290 to 265 Ma) granulite-facies event (peak at 860°C, 8 kbar) in the Valpelline Series, and by Permian (~290 Ma) granitoids that intruded at 750°C, 4-5 kbar in the Arolla Series. It is therefore concluded that the Valpelline and Arolla Series are representatives of the lower and upper crust, respectively, of the Adriatic continent.

The Alpine history is heterogeneously preserved in both the Valpelline and the Arolla Series. In the Valpelline Series, previous authors described rare relics of chloritoid-mica in cordierite pseudomorphs and kyanite replacing silllimanite. The lack of extensive blueschist-facies overprint could be due to the low a(H_2O) activity and/or the lack of Alpine ductile deformation. In the Arolla Series, highly strained granitoids display glaucophane-phengite (10-14 kbar, 400-500°C) overprinted by actinolite-chlorite (2-4 kbar, 220-330°C). This transition from blueschist-facies to greenschist-facies parageneses is also seen in some metacherts.

Two main tectonic boundaries are observed within the DBTS. Firstly, the contact between the Arolla and Valpelline Series is marked by a thick (10 m) zone of mylonites that locally display blueschist-facies minerals (blue amphibole, garnet, phengite, aegirine-augite), overprinted by greenschist-facies assemblages. The dominant foliation in the Arolla-Valpelline mylonites shows a prominent NW-SE stretching lineation, and both these structures are overprinted by NE-SW trending folds.

Secondly, the Roisan-Cignana-Shear-Zone (RCSZ) is a NW-dipping shear zone, which cuts through the Arolla-Valpelline contact and separates the DBTS in two subunits, the Dent Blanche nappe to the NW and the Mont Mary nappe to the SW. It results from several deformation phases developed at blueschist (13±2 kbar, 480±50°C) then greenschist (2-4 kbar, 200-300°C) facies conditions. Within this shear zone, tectonic slices of Mesozoic and pre-Alpine metasediments are amalgamated with continental basement rocks. The occurrence of blueschist-facies assemblages along the contact between these tectonic slices indicates that the amalgamation occurred prior to or during the subduction process, at an early stage of the Alpine orogenic cycle.

The structural, petrological and geochronological data provided in this study and those available in the previous works enable us to propose a possible kinematic evolution for the current geometry of the Austroalpine domain. We will discuss the contributions of (i) the Permian lithospheric thinning, (ii) the Jurassic rifting and (iii) the subduction-collision processes in controlling the final geometry of the Austroalpine domain.

Tectonic models for Adria and the External Dinarides in the context of Jurassic-Cretaceous paleomagnetic results

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Adria is a crustal block playing an important role in the geodynamic history of the Central Mediterranean s.l. Recently, a reliable Late Jurassic – Eocene APW path was obtained for its “autochthonous” core. This can serve as a reference frame for describing displacements in its more tectonized margins, like the External Dinarides, where we also carried out systematic paleomagnetic investigation, involving Gorski Kotar and the Velebit Mts from the mainland, several islands of the Northern Adriatic basin, and further in the south, Dugi otok and Vis islands.

The External Dinarides have a complicated internal structure. That is why the tectonic models published for the area are diverse. When the different models are inspected in the

context of the above mentioned paleomagnetic data, we can conclude that. 1. the Adriatic islands from the Northern Adriatic basin down to Vis island must have moved in close coordination from the Albian on, although some tectonic models place them to different tectonic units. 2. coeval paleomagnetic directions for the Adriatic islands and for "autochthonous" Adria are co-incident from the late Albian on, thus the paleomagnetic results support the models which regard the former as the imbricated margin of the latter. 3. the Northern Adriatic mainland rotated about 30° CW with respect to Adria, which may be regarded as "inherited" (two carbonate platforms) or may signify relative rotation during Late Eocene between the thrust sheets of the mainland and Adria.

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Identification of tectonically active areas in the Panonnain basin: a combination of DEM based morphotectonic and structural analysis of Bilogora Mt. area (NE Croatia)

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Bilogora Mt., which is predominantly composed of highly deformed Pliocene-Quaternary clastic sediments, represents more than 90 km long and 10 km wide young transpressional structure related to the NW-striking Drava basin boundary fault (DBBF). DBBF was reactivated from originally normal into dextral fault accommodating c. 10 km displacement during Pliocene-Quaternary transpression in the southern part of the Pannonian Basin. On-going tectonic activity is documented by historical seismicity reporting several moderate earthquakes of intensity VI°-VIII° MCS in vicinity of larger towns. It is characterized by NE-SW orientation of the greatest horizontal stress direction determined from fault plane solutions of instrumentally recorded earthquakes (3,5≤ML≤5,6), indicating steeply NE-dipping, and S-SW dipping seismogenic structures with predominantly strike-slip and reverse motions.

Landscape features has been analyzed by DEM raster with 10 m cell resolution. It was modeled and analyzed using ESRI ArcMap 9.x.x. software package with CalHypso, Spatial Analyst, ArcHydro 1.1 and StPro extensions as well as Matlab software. Study area was divided into 130 drainage units. For each unit relative elevation and slope distribution values, drainage unit area-altitude relations (hypsometric integral values) as well as unit absolute asymmetry ratios were calculated. In addition, we analyzed main drainage longitudinal trunk channel statistical values extrapolating parameters of maximum concavity (Cmax), position of maximum concavity (Δl/L), concavity factor (Cf), steepness index (ksn) and concavity index (θ). All calculated geomorphic parameters have been combined and overlayed as rasters, which enable a separation of drainage units characterized by geomorphic parameters that could possibly indicate an on-going tectonic deformation. These units are located between towns of Koprivnica and Pitomača on northeastern slopes and in the vicinity of Daruvar on southwestern slopes, in the northwestern and southeastern part of Bilogora Mt., respectively.

To verify about a possible relationship between geomorphic indices and tectonic deformation a set of 72 reflection seismic sections was analyzed using Schlumberger Petrel Seismic to Simulation software. This software enabled construction of structural depth model comprising 6 stratigraphic horizons and more than 50 faults active during the Neogene-