based on paleo-heat flow estimates, indicate a similar increase in lithospheric strength with time. The impact of Plio-/Pleistocene volcanism on rheology appears to be relatively modest, which can be explained by a deep position of the magma chamber for this event.

Tertiary Basins in Slovenia

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Tertiary basins in eastern Slovenia form part of the Pannonian Basin System. They are situated at the junction between the Eastern Alps, Southern Alps, Dinarides, and the Pannonian realm. Major WNW-ESE to E-W trending fault zones (Periadriatic and Donat shear zones, Sostanj and Sava-Celje faults) separate different tectonostratigraphic units.

North of the Donat Line (Units A1, A2) the oldest Tertiary sediments are Eocene (Paleocene?) in age. After a phase of major erosion, more than 5000 m thick sediments were deposited during Karpatian to late Miocene times. Oligocene and/or early Miocene magmatism (Pohorje tonalite) and early Miocene dacitic volcanism are important features of Unit A1 (north of the Periadriatic Lineament).

South of the Donat Line (Units B1, B2) the oldest Tertiary sediments including andesitic tuffs are of Oligocene and lowermost Miocene age. Badenian to late Miocene sediments follow after a stratigraphic gap.

Sediments of Unit A1 (north of the Periadriatic Line) exhibit consistent CCW rotation of about 30°. Unit B2 (Sava Folds) is characterized by moderate (20 to 30°) CW rotations. The rotations must be younger than Badenian. Units A2 und B1 are more complex and both CW and CCW rotations occur. However, CW rotations are far more frequent. These rotations must have occurred in post-Karpatian time, probably simultanously with movements in Units A1 and B2.

Brittle deformation of NE Slovenia was characterized by NNW-SSE (NW-SE to N-S) compression and perpendicular tension. The above fault zones were characterized by dextral strike-slip. This deformation was associated with folding and verticalisation of beds. Dextral transpression took place during the early Miocene (Ottnangian, Karpatian), reoccurred several times during the late Miocene and Pliocene, and lasted to the Quaternary. Situated between the major shear-zones, the Smrekovec area (Unit B1) is characterized by sinistral transpression, while the Savinja block was affected by dextral transtension. In the Mura depression NE-SW tension occurred, probably during the middle and late Miocene.

Several magmatic phases and high rates of vertical and horizontal movements resulted in a complicated thermal history. Early to middle Miocene thermal events occurred in Unit A1 (e.g. Pohorje and Gora Radgona areas). Coalification data indicate Paleogene and/or early Miocene thermal events along the Periadriatic Lineament in Units A1 and A2. Present-day heat flows are high (70 to 120 mW/m²). This is a result of thinned crust.

Paleogeographic and orogenic evolution of the Alps

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The paleogeographic evolution of the Alps during the Mesozoic was controlled by three basins partly underlain by oceanic lithosphere: the Meliata-Hallstatt basin (opened in the Middle Triassic, closed in the Late Jurassic), the Piemont-Liguria basin (opened in the Middle Jurassic, closed in the Paleogene, and the Valais basin (opened in the Late Jurassic to Early Cretaceous, closed in the Eocene). Some paleogeographic domains cannot be traced all along the Alpine chain: There are no Austroalpine units (in the strict sense) in the Western Alps while there is no Briançonnais in the Eastern Alps, where Valais and Liguria-Piemont oceanic domains merge.

Cretaceous orogeny is the result of (1) collision between the Austroalpine continental crust and another continent further to the east (Eastern Alps) and of (2) subduction of oceanic crust and/or continental fragments (Sesia zone eclogites) under the Austroalpine-South Alpine margin (Western and Central Alps). Collision with the Briançonnais terrain and European distal margin is related to a second orogenic cycle during the Tertiary, also associated with eclogite facies metamorphism (Dora Maira-Adula-Tauern). Tertiary-aged N-S convergence amounts to 500 km in the Central Alps (and probably also the Eastern Alps) while E-W shortening in the Western Alps is essentially post-collisional, post-dating sinistral strike slip movement related to N-S-shortening in the Central and Eastern Alps. Post-collisional shortening in the