and seismic profiling, regional litho-stratigraphical relations and facies distribution are explained. Due to the geochemical prospecting and correlation the most perspective zones are de-fined. All the data will be presented by the slides and/or transparency and on the posters.

A new model on the tectono-sedimentary evolution of southwestern Pannonian basin during the Late Miocene

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A new model on the tectono-sedimentary evolution of southernwestern Pannonian basin during the Late Miocene is presented. This was based on the interpretation of about 190 km of high-resolution, single-channel seismic profiles acquired on Lake Balaton and about 1700 km of multi-channel reflection seismics in SW Hungary.

Seismic stratigraphic interprertation has been calibrated by geologic mapping of selected areas and well logs. A magnetostratigraphic record was also available from a corehole in the study area, together with recent K/Ar dating of basaltic rocks from the Balaton highland.

The Late Neogene "post-rift" evolution of Pannonian basin was characterized, in a broad sense, by decreasing rates of subsidence (thermal subsidence), parallel with the increase of sedimentation rates. This resulted in a classic trangressive-regressive 2nd-order cycle, with general progradational patterns, followed by late-stage aggradation in the basin fill.

Our study showed that higher-order cyclicity can be also recognized at a regional scale in the Late Neogene "post-rift" sequence of south-western Pannonian basin. In particular, five 3rd-order sequence boundaries (Sar-1 and Pan-1 to Pan-4 Sequence Boundaries) can be documented on regional seismic profiles. Sequence Boundary Pan-2 has a magnetostratigraphic age of about 8.5 Ma and is associated with significant water-level drop in the Pannonian Lake and consequent exposure of basin margins that is widely recorded in the "marginal facies" of western Hungary.

The stratigraphic unit bounded by Pan-1 SB and Pan-4 SB is correlated with the Tortonian-Messinian 2nd-order cycle of the Mediterranean.

Following the Middle to Late Miocene extensional phase, the Pannonian area has experienced a tectonic reactivation during Late Pliocene and/or Quaternary. This is manifested by accelerated subsidence at the basin center and faulting associated with uplift and extensive erosion at the basin flanks. Erosional truncation of strata due to late-stage uplift of the Bakony mountains is best imaged by regional seismic profiles across southern Transdanubia and high-resolution seismic profiles of Lake Balaton.

The Neogene Styrian Basin

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The 100 km long, 60 km wide, and more than 4 km deep Styrian Basin is located at the eastern margin of the Alps and forms part of the Pannonian Basin System. It represents an extensional structure on top of a crustal wedge, which moved eastward during the final stages of the Alpine orogeny.

Basin evolution is subdivided into an early Miocene (Ottnangian to Karpatian) synrift and a middle to late Miocene postrift phase of subsidence. During the synrift phase thick clastic limnic/ fluviatile and marine sediments were deposited. The climax of extension during the synrift phase favoured the ascent of andesitic magmas. Today the voluminous shield volcanoes are nearly totally buried by younger sediments. An unconformity separates lower and middle Miocene sediments and is interpreted as the transition from the synrift to the postrift stage. During the postrift stage intercalations of sandy and shaly sediments and algal reefs were deposited. Basin inversion resulted in the erosion of a few hundred meters of sediment during the Pliocene and the Quaternary. Uplift was accompanied by a second volcanic phase producing basalts in Plio-/Pleistocene times.

The thermal history of the Styrian Basin was governed primarily by the Miocene magmatic event. Volcanic centers were characterized by extremely elevated heat flows (>300 mW/m^2) and heat flow decreased to background values (about 120 mW/m^2) at a distance of about 10 kilometers from the centers. After the early Badenian heat flows decreased and are in the range of 55 to 85 mW/m^2 since Sarmatian times. The volcanic activities in Plio-/Pleistocene times had only little influence on the regional heat flow pattern.

Subsidence analysis and the results of quantitative basin modelling suggest that the lithosphere beneath the Styrian Basin was extremely weak during Ottnangian-Karpatian times. This is probably due to high extension rates and high heat flows associated with Karpatian to early Badenian magmatic activity. Subsequent cooling enhanced the flexural rigidity. Depth dependant rheology models 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/m^2). 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