the uncoupled foreland depends on the strength of the sedimentary cover which includes three major parametres: friction of detachment surfaces, lithology, and section thickness. It is friction that is most important in dictating the distance of stress (i.e., strain) transmission. The Central Appalachian Mountains are characterized by a low friction detachment and a thicker sedimentary cover. Here stress (i.e., strain) is transmitted into the foreland by layer parallel shortening across a belt up over 400 km wide. The Southern Appalachian Mountains are characterized by higher friction detachments and a thinner sedimentary cover. Such a section suppresses stress (i.e., strain) transmission to the foreland and consequently the foreland fold-thrust belt is much narrower here. Foreland deformation in the Ouachita belt is further restricted as a consequence of formation of a very thick foreland clastic wedge during active collision.

Neotectonics of the Eastern Carpathian bend area and its foreland, Romania

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The Eastern Carpathians consist of a nappe pile made up of basement nappes in the western part and Early Cretaceous pelitic marine deposits, late Cretaceous to Paleogene flysch deposits, and Miocene to Quaternary molasse deposits in the central and eastern parts. Imbrication and internal deformation of the nappes took place in several periods of deformation from Late Cretaceous to Quaternary time with general rejuvenation of the structures from the west to the east affecting also distinct intra- to synorogenic deposits in piggy-back basins. Calc-alkaline to alkalibasaltic recent volcanism as well as late-stage intramount extensional basins in the back of the main orogen are additional features of this area. Several lines of evidence point to still ongoing active crustal deformation in the Eastern Carpathian bend area: Folding and tilting of Late Pliocene to Early Pleistocene sedimentary deposits.

Several levels of highly uplifted fluvial terrasses with indication of tilting of some terrasses along the Carpathian orogenic front.

A hydrographic network, whose geometry suggests strong influence of recent tectonic movements. This is particularly evident along the Carpathian orogenic front and its foreland where some deep crustal structures, like the Intramoesian and the Trotus Faults play also an important role. A clear temporal relationship can be observed between an older network of streams in the valleys crossing the Carpathian thrust and fold belt (Buzau, Teleajen, Prahova etc.) and a more recent hydrographic network in the intramount basins (Olt river basin).

A good correlation of the geometry of the actual hydrographic network, the area of recent crustal uplift, and recent shallow earthquakes point to the beginning of an ongoing inversion of the Focsani foreland basin.

The geometry between the intramount basins inside the Carpathians bend area and their relation to the Neogene to recent andesitic and basaltic volcanic centers can be related to still active extensional and transtensional crustal movements.

Post-Middle Pliocene uplift of the Ligurian and Provençal coasts (NW Italy and SE France): New kinematic constraints

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Along the coasts of NW Italy and SW France, Pliocene marine sediments, currently exposed at elevations up to 600 m indicate significant uplift in the Ligurian–Provençal area. After the cessation of the opening of the Ligurian-Provençal basin, the area was in tectonic quiescence. It is only since the late Pliocene that significant amount of uplift has taken place in the region.

Located on the intersection between the Alpine chain and a rifted basin, understanding the kinematics of the area is important. Interplay between these settings is obvious, but until now poorly understood. There is for instance an apparent contrast between the S–N compressional stress regime suggested by earthquake studies and the generally accepted predominance of normal fault at the earth's surface. Also the timing, kinematics as well as the stress regime under which this occurred is poorly known. Goal of this study is to come to an integrated reconstructing of the uplift/erosion history of the area. To do so, we will apply (U–Th)/He thermochronometry on apatites in combination with structural, stratigraphical and morphological field studies.

Structural and stratigraphical analyses of the Ventimiglia (NW Italy) area resulted in the recognition of at least two stages of deformation. Combined with the (U–Th)/He thermochronometry data, this will add new kinematic constraints to the recent evolution of the Ligurian–Provençal area.

Foreland basin evolution around the Western Alpine Arc

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Comparison of Tertiary depocentres in SE France with the North Alpine Foreland Basin (NAFB) provides new insight into the evolution of the arcuate western Alpine orogen. These foreland stratigraphies show that a continuous flexural basin developed from the mid to late Eocene on the European plate. The stratigraphy of this underfilled foreland basin is recognisable and consistent around the Alpine arc. Reconstruction of the limits of the marine transgression from Lutetian to Priabonian show the flexural basin becoming more arcuate with time as it migrated toward the NW ahead of the Apulian indentor. From early to late Oligocene, flexural subsidence accelerated in the frontal NAFB, which accumulated over 4 km of Lower Freshwater Molasse, closing off to the southwest. This phase was synchronous with the peak of alpine collision. In contrast, in SE France SW emplacement of the Embrunais-Ubaye (EU) exotic flysch nappes (up to 4 km thick) onto the the Southern Subalpine chains (SSC) did not generate a flexural response, implying that they were emplaced by shallowly rooted gravity gliding. Oligocene sedimentation in the SSC was confined to small thrust-sheet-top basins such as Barreme and Devoluy. At the same time, further out in the alpine foreland NW-SE extension generated the west European graben system. During the Burdigalian, marine conditions migrated from the Gulf of Lion northward along the European rift system into the NAFB where the Upper Marine Molasse was deposited. Transgression of marine conditions across the Digne-Valensole block (west of the SSC thrust front) is here related to the onset of thermal subsidence in the Gulf of Lion rift system. Throughout the Miocene, the internal and external Alps continued to shorten and rise, providing detritus to the NAFB and leading to the return of continental conditions (Upper Freshwater Molasse). Folding and thrusting in the Jura commenced around 11 Ma uplifting the NAFB. In the Pliocene, the external crystalline massifs were exhumed as evidenced by fission track analyses. These movements were contemporaneous with late thrusting in the Jura and Digne fold-thrust belts. While the NAFB was abandoned, sedimentation in SE France continued with 1 km of Pliocene conglomerates deposited in the Digne–Valensole basin, a depocentre created by the relative uplift of surrounding blocks: the Vaucluse massif to the west, the Digne thrust sheet to the east and the Maures-Esterel massif to the south.