METAMORPHIC EVOLUTION OF THE CENTRALALPS: SIGNIFICANCE OF THE SUBDUCTIONCHANNEL

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We propose that the Southern SteepBelt (SSB) represents alithospheric-scale melange belt. Tectonic accretion of fragments at ornear the Adriatic continental hangingwall during subduction of oceanicand continental elements is responsiblefor two main characteristics of the SSB: (1) high variability of rock types (various gneisses, metaclastics, carbonates, mafics and ultramafics); (2)ubiquity of discontinuous bands, layers,lenses. Slab break-off (at ~41 Ma) triggeredextrusion of the melange and underlyingnappes, with some elements starting atdepths of ~100 km. Rapid ascent with inthe subduction channel may have involvedadditional stacking, thrusting andfragmentation, as well as the addition of mantle material. Emplacement to uppercrustal levels (~15 km) was complete ~30Ma ago. Migmatites are widespread in the SSB; leucosomes vary from highly strained tounde formed and make up ~30 vol% in somezones. Partial melting on decompressionfacilitated extrusion of melangematerial inside the channel. Extrusionis supported by penetrative and intensetranspressional deformation in the SSB. The predominance of upper crustalmaterial, enriched in radiogenicelements, in the SSB strongly influencedthe thermal evolution of the Alpine subduction/collision system. Our 2D finite element models, which incorporate the above tectonic scenario, quantifythe thermal effects of tectonically accreted radioactive material on Barrovian metamorphism during the Tertiary. Late parts of PTt-paths in theLepontine are strongly affected by the dynamics in the subduction channel. These dynamics are responsible for rapidemplacement of high-pressure rocks andfor important parts of the thermal andmetamorphic evolution in collisionalorogens.