

MESOZOIC COOLING IN THE ADRIA CRUST (ULTEN UNIT)

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The Ulten unit (central eastern Italian Alps, Adria crust) is formed by stromatic gneisses including eclogites and spinel-garnet peridotites of Paleozoic age. They have been intruded by trondhjemitic magma during Carboniferous and have suffered a slow cooling through Permian (302–251 Ma, Rb-Sr ages on white mica) and Jurassic (187–160 Ma, Rb-Sr on biotite).

The existing data in the Ulten unit confirm a retrogressive path between ~391 Ma (Sm-Nd internal isochron on gt-cpx, peak age on eclogites) and ~357 Ma (Ar-Ar cooling age on hornblende from eclogitic metagabbros) interpreted as an exhumation path of subducted continental crust incorporating exotic slices of mantle peridotite. After the exhumation from eclogitic conditions, in the period 330–160 Ma, the Ulten basement went from conditions of $P \sim 1$ Gpa, $T \sim 600^\circ\text{C}$ at 330 Ma to $P \sim 0.3$ Gpa ($z \sim 10$ km) and $T \sim 300^\circ\text{C}$ at 160 Ma. In this period, we can recognize two substages: a first fast decompression between Late Carboniferous and Permian (0.3 Gpa, 500°C at 250 Ma), and a second substage with isobaric cooling at constant depth since 250 until 160 Ma.

Data supporting relationships with Mid Triassic thermal events well documented in the Southalpine basement and cover (Eastern

Dolomites, Val Rendena schists, Lake Como Dervio-Olgiasca schists) are rare in the Ulten zone. Differently, most biotite cooling data seem to be consistent with the time of the rifting tectonics in the Lake Como-Lake Lugano area and in the Brenta Dolomites (Norian-Lias time). Besides, the biotite Rb-Sr datings of the Ulten gneisses support a metamorphic evolution comparable to that observed in other Adriatic basement domains located at the borders of the Ligurian-Piedmont ocean during Mesozoic as the Austroalpine Margna and the Southalpine Monte Muggio units. As the Ulten unit, these do not show clear evidence for the Triassic thermal anomaly but registered the Jurassic time cooling interpreted as due to the opening of the Ligurian-Piedmont ocean.

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