



The geodynamic evolution of the Italian Southalpine Basement from the Late Neoproterozoic to the Carboniferous

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U–Pb ages obtained by LA-ICP-MS analyses of zircon cores from a low-grade Variscan metasediment from the Southalpine Basement (SAB), NE Italy, shed new light on the geodynamic evolution of the Gondwana-derived terranes forming the actual Alpine building. The new U–Pb ages provide the first evidence that detrital zircons within Variscan terranes on the Alpine front crystallized in magmatic rocks during the Archaean at 2.7–2.9 Ga, the Palaeoproterozoic at 1.8–2.1 Ga, the Meso and Neoproterozoic 1200–850, and Early to Mid-Palaeozoic at 650–375 Ma. The U–Pb dataset shows an age gap between ~ 1.8 and ~ 1.3 Ga, this timespan resemble the age gap in the sediments of the Armorican terranes, and indicates that the metasediment protolith is younger than Late Cambrian.

Herein we present new detrital zircon U–Pb ages from 6 samples ranging from Early Devonian to Late Neoproterozoic in depositional age, evaluating the connections to the adjacent tectonostratigraphic domains. Deposited in the external sections of the Gondwana platform, the oldest of these units underwent to the Cadomian tectonic event. Statistical comparisons of the age datasets of the autochthonous units of the SAB with allochthonous Variscan units proved that from the Lower Ordovician and Silurian to Early Carboniferous shelf sediments of the SAB were deposited at the southern passive margin of the Rheic Ocean. The detrital and inherited zircon grains from pre-Variscan basement rocks of the central to eastern part of the SAB demonstrate a distinct West African provenance for sediments and magmatic rocks in this part of peri-Gondwana. Data of Late Neoproterozoic to Early Carboniferous sedimentary rocks show little change in the sedimentary supply from the Neoproterozoic to the Devonian, which implies that Variscan portions of the Italian Alps did not leave the margin of Gondwana before the Variscan Orogeny. Hence, large parts of the pre-Variscan basement of Southern Europe may have remained with Africa in pre-Pangean time, which makes the Variscan Basement in NE Italy a remnant of a “Greater Africa” in Gondwanan Europe.