

## Hints on provenance and protolith age of medium to high-grade metamorphic metasediments from the Eastern Alps – based on detrital U/Pb zircon age distributions

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The Koralpe-Wölz Nappe System as part of the Upper Austroalpine Unit is generally characterised by medium to high grade (amphibolite and eclogite facies) Eo-Alpine (Cretaceous) metamorphism contemporaneous or subsequent to Alpine nappe stacking. The investigated units of the Koralpe-Wölz Nappe System were affected by Permian high-temperature–low-pressure metamorphism, basically related to lithospheric thinning subsequent to the Variscan orogeny. While the metamorphic conditions and the timing of the metamorphic events are well constrained, very little is known about the protolith ages of the widely distributed metasediments. They comprise huge masses of micaschist and paragneiss with intercalations of marble, quartzite, amphibolite and eclogite.

In this study we present data from U/Pb dating of detrital zircons measured on samples of several complexes of the Koralpe-Wölz Nappe System. Additionally, we give an outlook on the samples, which are already sampled and in progress at present. These age data will give information about potential provenance areas, maximum ages of sediment deposition and hints on the sedimentary environment.

Zircon age spectra of the Koralpe Complex show main peaks for Ordovician and Carboniferous ages. The maximum deposition age of the sedimentary precursor is defined by the youngest zircon detrital age of  $301 \pm 15$  Ma. However, the youngest zircon ages measured in this unit are in the range of 250–285 Ma. These texturally distinct zircons formed during Permian amphibolite facies and anatexis and are confirmed by ages measured on magmatic garnet from Permian pegmatites (THÖNI, 2002). A micaschist from the Saualpe Complex is dominated by zircons with ages of around 90 Ma. These ages indicate a metamorphic formation of the zircons during the Eo-Alpine tectonometamorphic event. The zircon age distribution in metasediments from the Rappold Complex is dominated by Cadomian ages. Youngest ages are in the range of 330–380 Ma indicating the upper age limit for the sedimentation of this unit.

The available detrital zircon data indicate different provenance areas for the metasediments of the Koralpe and Saualpe Complex with respect to the Rappold Complex. They indicate a late Carboniferous to early Permian depositional age for parts of the Koralpe Complex, which is surprisingly young. An enlarged data set including the samples in progress will help to reconstruct the Carboniferous paleogeographic arrangement of the Austroalpine basement units in the future.

### Reference

THÖNI, M. (2002): Sm-Nd isotope systematics in garnet from different lithologies (Eastern Alps): age results, and an evaluation of potential problems for garnet Sm–Nd chronometry. – *Chemical Geology*, **185**, 255–281, Amsterdam.