



Detrital U/Pb zircon age distribution in metasedimentary units of the Eastern Alps

Nils Frank (1), Walter Kurz (1), Dengfeng He (2), Ralf Schuster (3), Yunpeng Dong (2), and Christoph Hauzenberger (1)

(1) Institute of Earth Sciences, NAWI Graz Geocenter, University of Graz, Austria, (2) State Key Laboratory of Continental Dynamics, Department of Geology, Northwest University, China, (3) Department of Hard Rock Geology, Geological Survey of Austria, Vienna, Austria

The Koralpe-Wölz nappe system as part of the Upper Austroalpine nappes is generally characterized by medium to high grade (amphibolite and eclogite facies) Eo-Alpine metamorphism contemporaneous or subsequent to Alpine nappe stacking. In addition, the investigated units related to 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 protoliths ages of the widely distributed metasediments. They comprise huge masses of micaschists and paragneisses with intercalations of marbles, quartzites, amphibolites and eclogites. In this study we present first 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 a main peak of Ordovician and Carboniferous values. The maximum deposition age of the sedimentary precursor is defined by the youngest zircon detrital age of 301 ± 15 Ma. However, the youngest zircon ages determined from this unit are in the range of 250 to 285 Ma. These zircons formed during the Permian upper amphibolite facies imprint and confirm 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 are contemporaneous with 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 to 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 Complex and Saualpe Complex with respect to the Rappold Complex. They indicate a late Carboniferous 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.