with different Alpine PT histories or wether it represents a coherent unit that was subjected to eclogite facies conditions as a whole. Within the nappe, eclogite-facies conditions and post-peak pressure amphibolite-granulite-facies conditions display increasing peak temperatures between 500 °C and >750 °C from north to south.

We present Lu-Hf garnet ages and detailed garnet chemistry of eclogite samples from several locations throughout the Adula Nappe. Samples from the central Adula Nappe are characterised by the presence of two populations of garnet. A first generation yields a Variscan Lu-Hf age and a second one an Alpine (Late Eocene) age, a result already established at the locality Trescolmen and here shown for more locations. In eclogites from the southern Adula Nappe, Alpine metamorphic conditions completely reequilibrated Variscan assemblages and garnet reveals exclusively Eocene Lu-Hf ages. In contrast, garnet is almost unaffected by Alpine metamorphism and is consistently of Variscan age in the northern Adula Nappe. Hence, the degree of Alpine metamorphic overprint and an associated re-equilibration of the Lu-Hf system is maximal in the southern part of the unit and decreases towards the north. Isotopic ages are in line with microstructural observations and major-element maps of garnet. Element maps display fully equilibrated garnet in the southern Adula Nappe, i.e. garnet with a homogeneous composition due to diffusive reequilibration during Alpine metamorphism. In the central nappe, relicts of an older, partly reequilibrated Variscan garnet generation are overgrown by a second Alpine generation with perfectly preserved prograde zoning and no diffusive overprint at all. Towards the north, the Alpine generation becomes less abundant and is absent in the northermost eclogite sample.

Eocene garnet ages are about the same through the entire nappe, 35-38 Ma. This and the continuous gradient of Alpine metamorphic overprint in high-pressure assemblages strongly suggest that the Adula Nappe essentially remained coherent during Eocene high-pressure metamorphism and exhumation despite very intense deformation. The gneissic host rocks of eclogites very likely experienced the same high-pressure metamorphic conditions but did not completely equilibrate, and later re-equilibrated during exhumation (see also abstract by KURZAWSKI et al., same volume).

A review of magmatic zircon ages from the Rhodope Metamorphic Complex: tectonic implications

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The Rhodope Metamorphic Complex is a stack of thrust sheets assembled during a protracted history of tectonic deformation during the Mesozoic and Cenozoic. Most studies on the geology of the Rhodope Metamorphic Complex (including the Rhodope Massif and the Serbo-Macedonian Massif) are regional investigations and address local problems. As a result the number of local nominations and tectonic subdivisions made large scale tectonic interpretations difficult. JANAK et al. (2011) proposed a simplified tectonic subdivision, merging all the known units of the Rhodope Metamorphic Complex into four super units (allochthons), namely the Lower (LA), Middle (MA), Upper (UA), and Uppermost Allochthon (UMA).

Due to the scarcity of distinctive lithologies, geochronological characterization is particularly important and the amount of data is rapidly increasing. The majority of zircon U/Pb ages obtained by conventional ID-TIMS, SHRIMP or LA-ICP-MS from orthogneisses, amphibolites, and metagabbros rather date protolith formation than metamorphism. Another important group of zircon ages comes from syn- to posttectonic plutons that crosscut the metamorphic section and thus can also be used as reliable markers for the restoration of the geodynamic evolution of the Complex.

We review the available zircon age data in the framework of the allochthon subdivision scheme. In the LA, alpine granitoids are less than 34 Ma old and postdate stacking of the nappe pile. The MA additionally contains Late Cretaceous (70 - 65 Ma), Late Paleocene-Early Eocene (57 – 53 Ma) and Middle-Late Eocene (46 - 37 Ma) granitoids. Tertiary and Late Cretaceous granitoids are also found in the UA. Orthogneiss protoliths in the LA are mostly Variscan/Late Variscan (319 to 270 Ma) with a few older samples. In the MA, this age group occurs as well but most are 164 to 136 magmatic arc granitoids. In the western part of the UA (Vertiskos, Ograzhden), 460 to 432 orthogneiss protoliths occur. In the eastern Rhodopes both Variscan and Jurassic protoliths occur in units presently attributed to the UA (Kimi, Kardzhali units) but these series may also contain parts of the MA. Protoliths of mafic rocks are around 570 Ma (UA), 470 to 430 (UA and MA), 312 - 253 Ma (UA and MA), and ca. 160 Ma (MA, UMA).

The age distribution provides constraints for the paleogeographic reconstruction. It is compatible with a model where the units were stacked by Late Cretaceous to Palaeogene southwestward thrusting, the UA representing Europe, the LA Apulia, and the MA comprising elements of the Vardar Ocean (160 Ma ophiolite), adjacent magmatic arcs (Late Jurassic granitoids), and possibly Pelagonian continental and Pindos-Cyclades oceanic crust. The UMA comes from the Vardar Ocean and associated arcs as well but was thrust towards north onto Europe already in the Late Jurassic to Early Cretaceous.

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Distinguishing different generations of deformation structures by structural and magnetic fabric analyses: examples from the Central gneiss (Tauern window) and Tschigotgranodiorite (Eastern Alps)

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The classical methods of structural geology prove the polyphase tectonometamorphic history of rocks mostly relying on relationships between different generations of foliations, lineations and folds. In schists and paragneisses due to their varied and finer grained composition, the relationships between different generations of foliations and lineations are easier to define. In contrary, the monotonous and coarse-grained orthogneisses make this task more complicate and it is often difficult to distinguish between different generations of structures.

The anisotropy of magnetic susceptibility (AMS) is a standard method for structural investigations of undeformed and deformed igneous, sedimentary and metamorphic rocks. In deformed rocks and shear zones AMS can reveal the position of the finite-strain axes. In such cases the principal axes of the magnetic ellipsoid ($K_{max} \geq K_{int} \geq K_{min}$) are in agreement with the X, Y and Z strain axes (i.e. with the stretching lineation and mylonitic foliation). On the other hand the magnetic lineation (K_{max}) can parallel the intersection of two different planar fabrics. In these cases the pole to the magnetic foliation (K_{min}) coincides with the