Variscan and Eo-Alpine eclogites of the Schober Group (Austroalpine)

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The Schober Group is located in the Lower Central Austroalpine, which comprises pre-Permian basement rocks with Variscan metamorphism, partly overprinted by Cretaceous metamorphism.

At the Prijakt Mountain in the western part of the Schober Group, a several hundred meters thick eclogite body occurs. The protolith age is 590 ± 4 Ma obtained by Pb-Pb zircon dating (Schulz and Bombach, 2003). The age of the high-pressure metamorphism, Variscan vs. Alpine, is controversial. Based on petrology and structure, Schulz (1993) proposed early-Variscan high-pressure metamorphism for the eclogites with P/T conditions of 1.4-1.6 GPa and 550-650 °C. Linner (1999) obtained a garnet-whole rock Sm-Nd age of 115 ± 33 Ma for the Prijakt eclogites and therefore proposed Eoalpine metamorphism at 1.6-1.8 GPa and 660 ± 30 ˚C.

We performed Lu-Hf geochronology on two eclogite samples from Prijakt. In both samples, two garnet generations occur. In one sample (PRI 4), the older generation (grt 1) is predominant with thin rims of grt 2, whereas in the other sample (PRI 3), grt 1 is only present as relics and grt 2 dominates. Lu-Hf ages are Late Carboniferous for PRI 4 (also confirmed by Sm-Nd) and Late Cretaceous for PRI 3. We interpret that these rocks experienced eclogite-facies metamorphism twice, in the Variscan and in the Eoalpine orogeny. While the Variscan eclogite paragenesis of PRI 3 was almost completely retrograded before the Eoalpine eclogite-facies metamorphism, PRI 4 preserved its Variscan high-pressure assemblage and therefore yielded a Variscan age. Thus our study confirms that the basement of the Schober Group was subducted twice, in the Variscan and in the Eoalpine orogeny.

References:

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