

## ECLOGITE EVOLUTION IN THE ALPS AND NORWAY

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The Alps contain mafic eclogite-facies rocks in the Zermatt-Saas zone (ZS) associated with a blueschist facies overprint. The Western Gneiss Region (WGR) of Norway consists of quartzofeldspathic gneisses with eclogite bodies on the m - km scale, associated with an amphibolite facies overprint. Despite these differences the two regions share common features. Both regions were unroofed in part by shear zones dipping in the same direction as the subduction zones (to the W in Norway; to the SE in the Alps, (WHEELER & BUTLER, 1993)). These shear zones preserve tectonites predominantly at greenschist facies.

In the Alps, activity on the Gressoney Shear Zone is dated at 45 - 36 Ma (REDDY et al., 1999) which overlaps with, or immediately postdates, peak UHP eclogite facies metamorphism in the rocks beneath. Higher-pressure structures related to exhumation are not particularly obvious, though fabrics defined by both omphacite and glaucophane are present in the ZS. The time span of activity, though, shows that the shear zone operated throughout unroofing from UHP to greenschist facies pressures and was therefore the agent of exhumation.

In Norway, an intermediate stage of exhumation is preserved in the amphibolite facies gneisses of the WGR, with fabrics related to pure shear in a transtensional regime. Intense constrictional strains, with folding with hinges parallel to lineation in eclogites, show that the transtensional regime began at eclogite facies (FOREMAN et al., 2005).

The similar geometry of extensional shear zones in the two orogens does not necessarily diagnose a common driving force. In the Alps extension was synchronous with thrusting as indicated by the migration of the foreland basin, dated in detail by stratigraphy (WHEELER et al., 2001) An internal buoyancy force is thus required to produce the exhumation. Though the ZS eclogites are dense, they lie above quartzofeldspathic rocks of the Monte Rosa unit and may have been carried up on the back of those less dense rocks. In Norway, in contrast, overall (oblique) plate divergence led to extension.

### References

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