



Remnants of a hyperextended passive margin in a Caledonian mélange unit below the Jotun nappe, Bøverdalen, Central-south Norway

Manar Alsaif (1,2), Johannes Jakob (1), Torgeir Andersen (1), Fernando Corfu (1,3)

(1) CEED, University of Oslo, Norway, (2) Schlumberger Information Solutions, Norway, (3) Department of Geosciences, University of Oslo, Norway

The Scandinavian Caledonides have been long studied, yet their ever unfolding complexity renders them far from being fully understood. It has been recognized that the Caledonian Allochthons have neither a linear nor straightforward along-strike relationship (Corfu et al. 2014). A mélange unit has been recently identified as a separate tectonic unit (Andersen et al. 2012). This unit is structurally positioned below crystalline nappes previously assigned to the Middle Allochthon. The mélange comprises meta-sediments and minor meta-basalt/gabbro, but most intriguingly, numerous solitary meta-peridotites. These occur as 'Alpine type' meta-peridotites, serpentinites, soapstones and detrital serpentinites. We present results of a field study of the mélange in the Bøverdalen area, structurally below the Jotun nappe, and suggest that this provides further evidence that the regional mélange unit was formed in a hyperextended passive margin. The meta-peridotites represent exhumed serpentinitized mantle and are intimately associated with meta-sediments. The sediments are garnetiferous chlorite-muscovite schists, graphitic schists, phyllites, amphibolites, meta-sandstones as well as quartzite-pebble dominated conglomerates. It is suggested that this highly heterogeneous unit formed during the early stages of rifting and hyperextension along the Baltican passive margin. Characteristics of the detrital peridotites suggests that serpentinite-talc protrusions may have formed islands. The processes involved are observed on modern margins where the best-studied example is the Iberia-Newfoundland passive margin. Work in present-day margins (mostly seismic reflection data) elucidate the large-scale structure of hyperextended margins, while studies of ancient exposed examples in mountain belts provide insight into the lithology, geochemistry and details of these margins. The widespread distribution of hyperextended margins in modern margins and the increasing number of recognizable ancient margins in mountain-belts indicates the importance of hyperextension during the early stages of the Wilson cycle. Tectonic reconstructions that account for such complexity may not only explain the origin of peridotite bearing mélange units, they may also aid the understanding of the exotic terranes identified in the Scandinavian Caledonides.

Andersen T.B., Corfu F., Labrousse L. and Osmundsen P.T. 2012 Evidence for hyperextension along the pre-Caledonian margin of Baltica. *Journal of the Geological Society, London* 169: 601-612

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