Remnants of pre 1650 Ma sediments in the Western Gneiss Complex, Norway

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The Western Gneiss Complex in south-western Norway are dominated by Proterozoic orthogneisses, which formed during three main episodes of magmatic activity: two "Gothian" episodes at 1600-1650 Ma and 1490-1520 Ma and a Sveconorwegian episode at 950-990 Ma (Skår, 2014). Sedimentary rocks, on the other hand, are scarce. The western parts of the WGC was later heavily deformed and metamorphosed during the Caledonian Orogeny, whereas in the east the Proterozoic rocks are more preserved.

This study, still in its early stages, focus detrital zircon age data from three sedimentary units in the WGC. These units occur in two different settings: a) as slivers embedded within the Proterozoic basement, and b) within the late Caledonian Nordfjord Sogn Detachment Zone (NSDZ). A quartzite sampled from the lower parts of the NSDZ yield a detrital zircon age distribution very similar to the age distribution of the WGC itself. We interpret these sediments as either a part of the Middle Allochthon or the Neoproterozoic sedimentary cover of the WGC that was brought down along the NSDZ. The sediments placed within the authochtonous part of the WGC yield very different age distributions. One, form the inner part of the Sognefjord area yield a distribution which is grossly similar to what is found elsewhere in southern Norway, south of the Caledonian nappes. Another sample is from further west within the area affected by Caledonian HP-metamorphism. This rock is either folded into- or form a xenolith in a 1650 Ma granite. The rage of detrital zircon ages in this rock is exclusively between 1730 and 2900 Ma. This age range is more typical of the Svecofennian domain in the eastern-north eastern part of Scandinavia, and we suggest these rocks are slivers of svecofennia-derived sediment into which the surrounding 1650 Ma granites intruded. The detrital zircon age distribution display similarities with the presumably oldest sediments in the Telemark sector of southern Norway, suggesting a link.

References:

Skår,Ø. 2014. 31st Nordic Geological Winter Meeting, Abstract volume, p. 96