

Neoproterozoic(?) and Palaeoproterozoic tectonometamorphic events affecting the basement-cover sequence on Ringvassøy, West Troms Basement Complex

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The West Troms Basement Complex is composed of blocks of 2.9–2.6 Ga TTG gneisses divided by 2.8–1.9 Ga supracrustal inliers, and is intruded by a 2.4 Ga mafic dyke swarm and c. 1.8 Ga plutonic complexes. The WTBC is considered a western continuation of the Fennoscandian Shield, supported by regional aeromagnetic data.

On Ringvassøy, basement tonalite gneiss has U–Pb zircon crystallisation ages of 2.84–2.82 Ga, similar to U–Pb zircon ages of 2.85–2.83 Ga for metavolcanics in the overlying Ringvassøy Greenstone Belt (RGB). Massive mafic dykes cutting the basement have U–Pb zircon and baddeleyite ages of 2.40 Ga, with a titanite age of 1.77 Ga interpreted as a metamorphic overprint. In one newly mapped location, the same dykes are observed to occur in the RGB but are displaced along the contact to the basement.

The main ductile foliation (S_1) in the basement and RGB is cut by the assumed 2.4 Ga dykes. This would place the D_1 event in the period 2.8–2.4 Ga. The presence of a small 2.7 Ga alkaline stock in another part of Ringvassøy may further constrain the upper age of D_1 .

The assumed 2.4 Ga dykes are cut by S_1 -parallel dextral shears (S_2). S_2 is in turn cut at a high angle by a set of steeply dipping sinistral shears (S_3) occupied by ultramafic dykes 2–3 m wide. S_3 shears seem to refract where they cross S_2 . The relationship of the ultramafic dykes to S_3 is uncertain: they could be pre- D_3 dykes exploited by D_3 shearing; or syn- D_3 intrusions from an ultramafic source at depth.

Age determinations of samples from the map area have been unsuccessful. However, D_1 evidently predates the assumed 2.4 Ga dykes and occurred within the Neoproterozoic to earliest Palaeoproterozoic. D_2 and D_3 clearly postdate the assumed 2.4 Ga dykes and are separate events. At least one of them may be Svecofennian, given the interpreted metamorphic overprint at 1.77 Ga in mafic dykes in the basement further south on Ringvassøy.