1.86 Ga granites in the Salo area, SW Finland

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The Svecofennian bedrock in the Salo area in SW Finland comprises granitoids and migmatised metasedimentary and metavolcanic rocks, metamorphosed in higher amphibolite and granulite facies conditions. The area is characterised by subhorizontal structures in large areas. We performed U-Pb zircon and monazite age determinations on two granites using the single-grain LA-MC-ICP-MS method.

One of the homogenous leucogranites, intruded into the subhorizontal structures, yielded a zircon age of c. 1.86 Ga. A younger c. 1.83 Ga age is interpreted as a metamorphic overprint. The sample also contained inherited zircons of various Palaeoproterozoic and Archaean ages. The monazites of the same sample showed two populations: c. 1.85 Ga and 1.81 Ga. At least the latter is interpreted as a metamorphic age. The other sample, a porphyritic granite, yielded an age of approximately 1.86-1.85 Ga. Monazite was not detected in this sample.

The 1.86-1.85 Ga granitoids are younger than those regarded as typical synorogenic Svecofennian ones but older than the voluminous late-orogenic granites related to high metamorphic temperatures. Although so far rarely described in Finland, they are common in the Ljusdal area in Central Sweden (Högdahl et al. 2008). Coeval mafic enclaves in the granites indicate a contemporaneous mantle activity and a possible heat source for the melting for which a middle crust source has been suggested (Väisänen et al. 2012). The inherited zircons imply that the magmas to some extent have a sedimentary origin. Future work will further examine this topic through in-situ Lu-Hf analyses on zircon.

References:

Högdahl, K., Sjöström, H., Andersson, U.B. and Ahl, M. 2008. Lithos 102, 435-459.

Väisänen, M., Johansson, Å., Andersson, U.B., Eklund, O. and Hölttä, P. 2012. Geol. Acta 10, 351-371.