



Lateral spreading control over magmatism – an example from the Central Finland granitoid complex

Kaisa Nikkilä, Francis Chopin, and Annakaisa Korja

University of Helsinki, Institute of Seismology, Department of Geosciences and Geography, Helsinki, Finland
(kaisa.nikkila@helsinki.fi)

After collision, partial melting takes place in thermally relaxed parts that are at depths greater than 25 km. Low density and viscosity magmas rise up to depths of 12 to 15 km where it is emplaced as flat-lying granites. Shearing helps to segregate magma and to guide it toward the surface.

The Paleoproterozoic Svecfennian orogenic domain of the Fennoscandian Shield hosts extensive Central Finland granitoid complex (CFGC) that has been emplaced during post-collisional phase between 1.890 Ga and 1.870 Ga. The complex consists of two sets of plutonic suites and minor amounts of associated supracrustal rocks. The older, low temperature granitoids are the melt product of metasedimentary and -volcanic rock association, whereas the younger high temperature granitoids have derived from partial melts of mafic granulites and mantle-derived basaltic magmas. All the examined plutonic rocks have some evidence of SE-NW striking shearing. Field evidences show that the first and second sets of granitoid rocks have intruded into the upper, brittle part of the crust in an extensional setting. We can also detect a low velocity layer in the upper parts of the middle crust. Where exposed in the areas surrounding the CFGC, it is composed of flow migmatites after metasedimentary and metavolcanic origin.

Our studies indicates that after the metamorphic peak at 1.890 Ga, a stress field producing SE-NW shearing has prevailed for a long period of time. The shear zones have facilitated the migration of granitic magmas to upper parts of the crust. The first set of granitoids have been pervasively deformed and intruded by second set of granitoids showing only localized deformation. It is suggested that this central part of the orogen suffered from late lateral spreading. The spreading may have been enhanced by granitic magma percolating within middle to upper crustal shear zones.