

GEOPHYSICAL AND GEOLOGICAL CHARACTERISTICS OF A PROTEROZOIC COLLISION ZONE IN SW FINLAND

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The Proterozoic collision zone in southern Finland between ca 1.885 Ma old southern Finland migmatite and central Finland granitoid blocks is characterized by sharp lithological, geophysical, petrophysical and geochemical contrasts. The characteristics of the zone was studied on a 60 km long profile across the suture. Using petrophysical parameters of granitoids the study area can be divided in high-density, high remanence low susceptibility southern migmatite zone and lower density, remanence and highly ferrimagnetic northern granitoid area. Geophysically, the southern migmatite block is characterized by gravity high and narrow linear magnetic and electromagnetic anomalies mainly due to pyrite or pyrrhotite bearing black schists. In contrast, the northern block dominated by highly magnetic intrusives is a regional gravity minimum. Seismically the crust in the study area is exceptionally thick (60 km) due to crustal thickening in the collision. Using chemical analysis the igneous rocks along the profile are classified into low- and high-aluminium groups. The high-aluminium samples, concentrated mainly to the northern part of the area have lower SiO₂-content but higher LREE and incompatibles compared to those of the more felsic low-aluminium group distributed over the whole study area. Thus, they cannot be derived directly from each other. The high-Al rocks are interpreted to represent rocks fractionated from mixture of mantle basalts and lower crust contaminated by oxidizing enriched fluids derived from sedimentary material from a subducting slab under the northern granitoid block. The low-Al rocks represent 'primary' crustal material fractionated in successive melting processes.