Geophysical Research Abstracts
Vol. 18, EGU2016-3129, 2016
EGU General Assembly 2016

Crustal Architecture along BABEL and FIRE profiles – Insight in the Growth of the Svecofennian Orogen

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The Precambrian Svecofennian orogen is characterized by LP- HT metamorphism and voluminous granitoid magmatism that usually develop in transitional to plateau stages of a collisional orogeny. Deep seismic reflection profiles BABEL and FIRE have been interpreted using PURC concepts: prowedge, retrowedg, uplifted plug, subduction conduit and elevated plateau.

BABEL profiles image a transitional orogen with several nuclei displaying prowedge-uplifted plug-retrowedge architecture above paleo-subduction conduits. Prowedge and -continent are on the south-southwestern side and retrowedge and -continent on the north-northwestern side. This implies a long-lived southwesterly retreating convergent margin, where transitional accretionary orogens have developed.

FIRE1-3 profiles images a hot orogen with a pronounced super-infra structure, typical of an elevated plateau stage, below the Central Finland Granitoid Complex. Large volumes of granitoid intrusions suggest large scale melting of the middle and/or lower crust. Reflection structures, analogue and numerical modeling suggest midcrustal flow. The plateau is flanked by prowedges that are characterized by HT-LP migmatite belts. The Svecofennian orogeny has progressed to an elevated plateau stage in the thickest core of the orogen, west of the arc-continent collision zone.