Geophysical Research Abstracts
Vol. 12, EGU2010-11571, 2010
EGU General Assembly 2010

A contribution to the kinematics of the Møre-Trøndelag Fault Complex (Western Norway)

Aline Saintot and Christophe Pascal
Geological Survey of Norway, 7491 Trondheim, Norway (aline.saintot@ngu.no)

The Møre-Trøndelag Fault Complex (MTFC; Western Norway) is a ∼50 km wide and ∼300 km long corridor of ENE-WSW pervasive fault segments. The nucleation of this long-lived fault complex is not well resolved but high strain in the ductile deformation field certainly occurred during the Caledonian Orogeny that resulted in the development of a steep ENE-WSW planar ductile fabric in the Precambrian metamorphic (mostly gneissic) rocks. Discrete ENE-WSW steep ductile shear zones also formed with a sinistral component during a late Caledonian stage (i.e. Scandian phase). Semi-brittle and brittle fault segments with an associated cortege of fault rocks are superimposed on the ENE-WSW steep ductile grain. The brittle behaviour along the MTFC is inferred to relate to the Devonian syn- and/or post-Caledonian orogenic collapse, to the Jurassic rifted basin tectonics and, perhaps, to the early Eocene North Atlantic opening. Whatever the history of the MTFC, the fault pattern is such that most of the larger fault segments are nowadays at the bottom of the striking parallel fjords and valleys buried under a pile of Quaternary sediments. This limits the possibility to unravel the evolution of the whole MTFC and until now, the relevant studies are few and maybe too spatially restricted to lead to firm conclusions at the scale of the whole MTFC. Therefore, to add data and constraints that may correlate for an overall history of the MTFC, we investigated a poorly studied zone by an integrated geophysical and geological study in order to characterise the main fault segments in terms of geometry, structural development and kinematics. Specifically, the latter aim is reached by a systematic analysis of the brittle structures and of the kinematic indicators in the surroundings of what are believed to be major fault segments. Some hundreds of field measurements from spatially well-distributed localities allow to accurately determine the patterns of successive brittle deformation phases with, in some cases, the corresponding paleostress states. The observation of cross-cutting relationships between structures and of associated specific mineral phases may serve to better constrain the timing of the different tectonic phases.