Geophysical Research Abstracts, Vol. 8, 02731, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02731

Paleostress field and brittle deformation of the Tornquist Zone in Scania (Sweden) during Permo-Mesozoic times

F. Bergerat (1), J. Angelier (2) and P.G. Andréasson (3)

(1) Tectonique, UMR 7072 CNRS-UPMC, Paris, France, (2) Géosciences AZUR, UMR 6526, Villefranche-sur-Mer, France, (3) Geobiosphere Science Centre, Lund, Sweden, (bergerat@lgs.jussieu.fr)

In Northern Europe, the NW-SE-oriented Sorgenfrei-Tornquist Zone is the north-western extension of the Teisseyre-Tornquist Zone (TTZ). The geological history of the TTZ s.l. was long and complex. It initiated as a dextral mega-shear zone during a post-Variscan wrench phase, then developed as a through during the Permian-Triassic rifting phase, and finally underwent major structural inversion at the end of the Cretaceous.

Although the tectonic evolution in the different parts of the TTZ has been widely discussed, little paleostress reconstructions have been done except in the middle and south-eastern TTZ (Holy Cross Mountains and Dobrogea). We present a first analysis of brittle deformation and related stress fields, based on fault-slip field measurement carried out in Scania, in the south-eastern part of the Sorgenfrei-Tornquist Zone.

Our data have been carried out in volcanic, granitic, gneissic and sedimentary rocks, Precambrian to Campanian in age. We considered both the striated fault planes and the accompanying mineralization. The faults often contain fillings of fluorite, quartz, calcite, galena, and sphalerite, for which a lower Permian age has been postulated, based on lead isotopic data. The brittle structures measured in Precambrian and Cambrian rocks are generally mineralized and can be attributed to post-Variscan deformation according to the age of minerals.

Therefore, although Post-Palaeozoic outcrops are few, we identified the main paleostress fields that took place during the Permo-Mesozoic times. Because of polyphase

tectonics in the studied area, we had to split the total population of fault slip data, at each site, in sub-groups, based on mechanical consistencies and relative chronological criteria, each sub-group being consistent with a specific stress regime.

Five principal tectonic episodes have thus been characterised: (1) NE-SW extension with strike-slip faulting, left-lateral transtension and injection of Permian dykes, (2) NNW-SSE compression and ENE-WSW extension, inducing right-lateral motion along the TTZ with fluorite mineralization, (3) ENE-WSW compression and SSE-NNW extension with calcite and galena mineralization, (4) NW-SE and NE-SW extensions from Jurassic to Campanian, and (5) NE-SW compression inducing reverse faulting and thrusting.