Geophysical Research Abstracts, Vol. 7, 06505, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06505

Distributed strain in an orogen-scale thrust system affecting an anatectic-magmatic segment of the Ribeira-Araçuai belt, Brazil

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In contractional orogenic domains, crustal thickening occurs through thrusting. There is a large consensus that, in a thrusting system, most of the displacement is accommodated by localized deformation at the base of the allochtonous units. The neoproterozoic Ribeira-Araçuai belt displays a different strain pattern since no evidence of strain localization is observed across several allochtonous units. It rather shows a deformation homogeneously distributed across a very thick pile of thrusted material. The allochtonous complex displays a $>$5km thick layer of high-grade mylonites at the base then several units mostly formed of pre- to early orogenic magmatic bodies (tonalites, grano-diorites...) with a subsidiary proportion of metasediments. At the top of the pile is a thick ($>$10km?) unit of anatectic crust intruded by several granitoids bodies. All this material displays a rather similar fabric suggesting it was deformed in the same way. Early orogenic granitoids as well as the anatectic unit display a magmatic fabric coherent with the solid-state deformation in the high-grade mylonites that form the sole of the allochtonous complex. No contrast in strain intensity is observed and the contacts between the various units merely represent lithological contacts. This means that pervasive melting and magmatic intrusions affected this crust segment, at the time of the orogenesis. Despite the viscosity was likely relatively low the whole segment deformed coherently and likely allowed deformation to be transferred from the base of the crust to the upper crust. The structure of the Ribeira-Araçuai belt strongly resembles to the one suggested from the INDEPTH experiment in Tibet. An interesting

point is that in Tibet, active faults are present above the partially melted layer, and this raises the question of the mechanical coupling between the seismogenic crust and a partially melted middle-crust.