# PARTIAL MELTING AND FLOW OF OROGENS:FROM THE FIELD TO THE MODEL

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The comparision of large orogenic beltsformed at convergent plate boundariesindicates that orogenic evolutioncomprises a period of crustal thickeningfollowed by the formation of acontinental plateau and commonly syn-topost-convergence extension and thinningof the rpeviously thickened crust. Instantaneous and finite strainsrecorded in orogenic belts during thisevolution do not appear lnked in asimple way to plate kinematicssuggesting that deformation ofcontinental crust is not solelycontrolled by horizontal compression dueto plate convergence, and gravity-drivenflow is likely to play a significantrole on the deformation of thickenedcrust. Geophysical data in southernTibet, an actively convergent orogen,and geologic data of the exhumedmid-crustal core of collapsed orogensreveal that orogenic crust is affectedby widespread partial melting. Partialmelting of thermally mature zones ofthickened crust results in thegeneration of a layer of low-viscosityrocks that may control the behaviour oforogenic belts. In particular, thepresence of this layer may favourmechanical decoupling between thesubducting plate and the overlyingthickened orogenic crust and allow flowof the crust driven by contrasts ofgravitational potential energy. Thermal-mechanical numerical modellingof the dynamic evolution of convergentorogens controlled by lithosphericsubduction provides constraints on thephysical conditions required to generatehigh temperature in an orogenic crustand on the rheological structure leadingto mechanical decoupling of a weakenedcrust above a subducting lithosphericplate.