Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08457, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08457
EGU General Assembly 2008


# Collisional Processes in the Africa-Eurasia Convergence Zone

**M.J.R. Wortel**, R. Govers and W. Spakman

Faculty of Geosciences, Utrecht University, Utrecht, The Netherlands (wortel@geo.uu.nl)

The Mediterranean region is known as a convergent plate boundary zone of the African and Eurasian plates. Prompted by the geology of the Alps the region is often referred to as being in the state of continental collision. Throughout the region the nature of the collision, however, varies strongly, and distinction has been made between between "hard" and "soft" collision. In this study we focus on the lithospheric scale of the plate interaction and in doing so we combine seismic tomography results with numerical modeling results on plate boundary processes and observational evidence.

Lateral variations (along the strike of the subduction zone) in properties of the subducting plates, from oceanic to continental, lead to segmentation of the plate boundary, giving rise to formation of separate arc structures characteristic of Mediterranean geology. The lithospheric scale processes involve arc-continent or continent-continent collision (collectively referred to as continental collision), slab detachment, possibly vertical tearing of the subducting slab, the formation of STEP (Subduction-Transform Edge Propagator) faults, and back-arc extension. The high curvature arcs in the Mediterranean region point to the significance of STEP faults. Examples will be given from both the western-central Mediterranean and the eastern Mediterranean region. In the former the arc-continent collision along the North African and Adria margins is crucial for understanding the geodynamical evolution, whereas in the latter the Bitlis collision appears to trigger the formation of the Cyprus arc. Since continental collision affects the geometry of the interacting plates, in particular the configuration of the plate contact zone and of the subducting slab, it affects (post-collisional) magmatism and tectonic evolution through changes in upper mantle PT conditions and effective slab pull forces. In combination, the transient processes envisaged account for many

striking features in Mediterranean geology.