Geophysical Research Abstracts, Vol. 9, 02923, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-02923

Tectonic Coupling and Decoupling between Pre-Messinian Basement and Plio-Quaternary Overburden South of the Florence Rise (Eastern Mediterranean): Structural Analysis and Analogue Modelling

N. Sellier (1), L. Loncke (1,2), B. C. Vendeville (1), J. Mascle (3)

(1) UMR 8110 Université des Sciences et Technologies de Lille 1, Cité Scientifique - Bat. SN5 59655 Villeneuve d'Ascq Cedex – France, (2) Université de Picardie Jules Verne, Sciences de la Terre, 80000 Amiens – France, (3) UMR Gé (rico.sellier@wanadoo.fr / Fax: +33 320 43 49 10)

The boundary between the African and Anatolian plates corresponds to a subduction zone that formed the Cyprus arc accretionnary prism. The western region of the prism (the Florence Rise) was partially covered by a thick evaporitic layer during the Messinian salinity crisis. Thereafter, deposition of Plio-Quaternary sediments onto mobile Messinian evaporites triggered gravity-driven salt tectonics that controls the structural evolution of the Nile deep-sea fan. We conducted a structural analysis of seismic and bathymetric data in the area. Our study reveals that the structure and morphology of the subsalt, pre-Messinian basement has influenced thin-skinned salt tectonics during Plio-Quaternary times. We also tested our interpretation using analogue models.

In the immediate vicinity of the Florence Rise (i.e., the highest part of the pre-Messinian accretionnary prism), crustal tectonics (mainly strike slip) is characterized by a strong coupling between the subsalt basement and the overburden.

South of the Florence Rise, in the internal domain, deformation was decoupled. For example, there is evidence for local thin-skinned extension (gravity gliding) above a crustal piggyback basin with evaporitic infill. There, tectonic decoupling allowed for local shallow extension above an active compressional basement structure.

Farther South, in the distal part of the Nile deep-sea fan, the mobile salt thickness reaches up to 2000 m, and tectonic decoupling is thus greater. Deformation is dominated by gravity spreading of the deep-sea fan above the evaporites acting essentially as a weak decollement layer. The pre-Messinian structures (i.e., the pre-Messinian accretionnary prism and the Eratosthenes seamount) behave as passive buttresses against which the distal tip of the deep-sea fan collides. Shortening is accommodated by sets of *en echelon* folds trending obliquely with respect to the basement structures in a transpressional regime.