Geophysical Research Abstracts, Vol. 8, 07261, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07261

Tectonics and large-scale mass wasting along the slope of the southern Adriatic basin

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The southern Adriatic basin is a sub-circular depression, more than 1000 m deep, located between the coasts of Puglia, to the west, and Albania, Montenegro and Croatia to the east. The W-verging Dinaride-Albanide fold-and-thrust belt runs along the eastern boundary of the Adriatic basin, and the intense seismic activity indicates that this fold-and-thrust belt is presently deforming. The basin is the current foredeep of the Albanide fold-and-thrust belt (De Alteriis, 1995; Argnani et al., 1996; Bertotti et al., 2001) and partly owes its remarkable water depth to the Mesozoic palaeogeography of the region (Argnani et al., 1996); in fact the southern Adriatic basin is superposed to a Mesozoic epicontinental basin which is bounded to the north and south by Mesozoic shallow-water carbonate platforms, the Dalmatian and Apulian platforms, respectively. The Mesozoic paleogeography of the Adriatic region exerted a major control also on the geological evolution and current tectonic setting of the southern Adriatic basin, and several deformational features affecting the recentmost sediments can be related to the Mesozoic inherited palaeotopography. Regional high-resolution multichannel seismic profiles acquired all across the southern Adriatic basin allow to outline the structural and sedimentary architecture of the basin slope. The eastern and western slope of the southern Adriatic basin present remarkable difference. The eastern slope is characterized by a thick stack of prograding units, fed by sediments coming from the adjacent fold-and-thrust belt (Roure et al., 2004), and presents extensive evidence of large-scale mass wasting throughout its Quaternary evolution. Because of the combined contribution of foredeep subsidence and Quaternary sea level fluctuation the shelf edge is relict, with sediments currently stored at the Albanian coastline. The eastern slope of the southern Adriatic basin, therefore, appears as a destructive slope system affected by progressive retreat which is mainly due to mass wasting processes.

The intense seismicity at the tectonically active front of the Albanide-Dinaride fold-and-thrust belt likely contributes to destabilize the basin slope. On the other hand, the western slope, which is adjacent to the low relief Apulian foreland, is characterised by a relatively reduced sediment supply. Tectonic and seismic activity are limited or absent over most of Puglia, with Gargano being the only exception (De Dominiciis and Mazzoldi, 1987; Argnani et al., 1993; De Alteriis and Aiello, 1993). Along the western slope of the southern Adriatic basin a key role in controlling the major Quaternary geomorphological features is played by the articulated and steep margin of the Mesozoic carbonate platform which represents a major mechanical discontinuity within the sedimentary succession. Creep and faulting driven dy differential compaction tend to affect the sediments located above the carbonate platform margin. The ensuing mechanical weakening can led to focussing of mass wasting and erosion into specific places along the western slope of the basin.

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