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# Gravity sliding in basinal setting, a surficial record of tectonic and geodynamic evolution; examples from the southern W. Alps and their foreland

T. Dumont, V. Franzi, and S. J. Matthews
(Thierry.Dumont@ujf-grenoble.fr)

The occurrence of large-scale submarine landslides, although commonly observed in the present basins, is only exceptionally mentioned in the Alpine orogen and foreland. The southern part of the Western Alpine arc and the SE basin of France provide examples of such features which could be related with particular geodynamic events, in relation with the motion of the Iberian and Adriatic microplates :
- A >50km2 slump scar formed in Aptian times at the northwestern edge of the SE France (so-called Vocontian) basin, giving a low-angle detachment surface which was onlapped by Albian hemipelagic marls (Ferry & Flandrin, 1979). The latter mark the maximum deepening stage of the basin, and the head of the scar is located over a deep-seated fault bounding the platform, which strongly suggest that sliding was caused by differential subsidence due to Middle Cretaceous extension, as a consequence of Iberia-Europe divergence.
- Later on, a deep-marine erosion surface developed further down the basin over a >100km2 area (Dévoluy massif; Michard et al., 2010), which had been previously affected by Mid-Cretaceous extension. Typical inversion structures are found beneath the surface, which indicate that NS shortening overprinted the extensional pattern. The removal of up to 400m of Mesozoic sediments was controlled by gravity processes, probably triggered by the deformation of the basin floor following tectonic inversion. The overlying pelagic carbonates indicate that shortening occurred before the Campanian, which is closely comparable with the earliest stages of tectonic inversion in the Pyrenees.
- The transition slope between the Paleogene Alpine flexural basin and the NW-ward propagating accretionary prism provides examples of basin floor degradation and of gravity-driven emplacement of large-scale blocks, generally regarded as thrust-sheets in the Alps. These features allow to reconstruct the early stages of the Adria-Europe collision, which strongly differ from the Oligo-Miocene dynamics and which are overprinted or crosscut by the modern orogen (Dumont et al., 2011).
Theses examples show that, in different structural and geodynamic settings, detailed analysis of basin floor morphology, (re)sediments transport directions, syndepositional deformations and provenance of exotic blocks can provide useful information about the regional kinematics, which can be integrated with other datasets, i.e. tectonic, metamorphic, thermochronologic, etc.

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