



## **Preservation of paleofaults and related depositional geometry in a large-scale low-strain block within the Ligurian Brianç**

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The Triassic to Paleogene, mainly carbonate sedimentary succession of the Ligurian Briançonnais domain testifies a long-lasting (about 150 my) and complex evolutionary history that starts with the first phases of continental rifting, continues with the formation of the paleo-European passive margin, linked to the opening of the Ligurian Tethys ocean, and ends with the beginning of the continental collision. A thin (few hundreds meters), discontinuous and condensed stratigraphic succession records several structural reorganization phases, corresponding to important changes of the geometry of the sedimentary basin.

Within the Ligurian Briançonnais domain, largely involved by an intense alpine deformation which caused a widespread folding of the sedimentary successions, a large-scale low-strain block has been recognized (Marguareis-Cima delle Saline Unit). This block is bounded by first-order faults and shear zones and shows a relatively low degree of deformation and a good preservation of the primary stratigraphic features. Within this block, km-scale N-S faults are present and show several hundred metres displacement. These faults have been previously interpreted as either normal, inverse or transcurrent alpine faults. Our researches, on the contrary, highlighted that some of them are much older and that their activity controlled sea-floor topography and sedimentation. This new interpretation is grounded on the following observations:

- large paleoescarpments cutting down all stratigraphical units are still well preserved; their nature of depositional surfaces is demonstrated by:

- the widespread occurrence of a blanket of sedimentary breccias, locally containing fragments of older cataclasites;
- occurrence of Eocene hemipelagic sediments onlapping these surfaces with anomalous stratigraphic contacts;
- olistoliths of Jurassic limestones ranging in size from few m<sup>3</sup> to thousands m<sup>3</sup> are commonly found resting on paleoescarpments.

Two are the foremost implications of these data:

- a new model for the tectono-sedimentary evolution of this external sector of the Ligurian Briançonnais domain (Marguareis-Cima delle Saline Unit): the extensional tectonic phase related to the liassic continental rifting has not been the only period of reorganization of the basin, neither the most important. During Eocene times, in fact, sedimentation was continuously deeply influenced by the activity of large normal faults, which controlled sea-floor topography and caused the formation of escarpments characterized by a strong gravity-driven instability;
- the existence of large low-strain blocks in the Ligurian Briançonnais domain imposes reconsideration of the Alpine kinematic evolution of this domain as well as the tectonic/stratigraphic relations with the adjacent Dauphinoise domain.