



The opening of Sirte basin: result of slab avalanching?

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North Africa's Sirte basin opening is an enigmatic feature in the complex Cretaceous-Paleocene rearrangement of Mediterranean tectonics. New borehole data inversion constrains the strain history showing that the strongest stretching event occurred ~ 50 Ma, lasted < 10 m.y. and recorded simultaneously with the same intensity in the whole area. This event is related to the neighboring Hellenic trench, as suggested by the orientation of the overall extension, and requires an abrupt additional forcing from this geodynamic context. This is compatible with the reconstruction of Aegean slab subduction and penetration in the lower mantle, and suggests that the Sirte basin opened in response to the abrupt increase of pull, transferred from deep penetrating slab to surface. This event is coeval with the initiation of dismantling of Hellenic orogen, preceding the extension in Aegean Sea, showing that the avalanching event has an important control on the tectonic evolution of a large area surrounding the convergent margin. The intense and short extensional event in the Sirte basin is the first surface evidence of fast avalanching in the lower mantle allowing constraining the magnitude and duration of this deep process.