
Age dating and triggering mechanisms of recent submarine landslides in the Alboran Sea

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Résumé

In the southern margin of the Alboran Sea, the sedimentary succession over the past 1 Myr contains several submarine landslides. We observe that their geographical distribution does not appear to be related to the active Al Idrissi fault system (AIFS) responsible of the recent earthquakes (i.e. they are located more than 10 km away). The head scarps of landslides west of AIFS coincide with the edges of the thickest parts of the contourite drifts dominating this margin. This evidence potentially supports the idea that landslide initiation is related to locally higher sedimentation rates in the edges of contourites, which drive upward fluid flow. Additionally, contourite edges overlying active blind thrusts, initiated during the Tortonian due to the Euro-African convergence, suggest that fluid flow could also result from tectonic activity. These two hypothesis converge on the following idea: local upward fluid flow reduces the effective stresses of contourite edges, thus preconditioning their stability and bringing the slopes to a sort of metastable state. While the distances between the investigated landslides and the AIFS cannot be used as evidence for earthquakes as potential triggers, the discussion of the far-reaching effects of earthquakes on metastable slopes remains open. During the Albacore cruise (NO Pourquoi Pas?, 2021) several calypso cores were collected at three sites west of the AIFS, both inside and outside landslides with a seafloor expression. The objective is to better understand the role of sedimentation rates in fluid flow generation and the potential effects of seismic loading on landslide triggering. Correlations between continuous density and magnetic susceptibility measurements of whole round cores and in-situ geotechnical measurements provide information about the presence of a sediment drape overlying landslide deposits. Isotopic $\delta^{18}\text{O}$ analysis of planktonic foraminifera from sediment cores, correlated with paleoceanographic records in the Alboran sea, suggests an age of 12-13 ka for the base of the sediment drape in all three sites, indicating a synchronous triggering mechanism.

Mots-Clés: submarine landslides, Alboran Sea, sediment cores, age dating, contourites, seismicity

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