



Passive recording of an active transform, an example from the Levant continental margin and the Dead Sea Fault

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Transform faults accommodate lateral motion between two adjacent plates. Records of plate motion and consequent boundary development on land is, at times, scarce and limited to structures along the fault axis. Investigation of a passive continental margin adjacent to the plate boundary might broaden the scope and provide estimates for its structural development. To examine this hypothesis, we analyzed depth and time migrated 3D seismic data together with four boreholes located along the southern Levant continental margin, ca. 100 Km from the continental Dead Sea fault (DSF). The analysis focus on the Plio-Pleistocene sequence, a key period in the development of the DSF. It includes formation of structural maps, stacking pattern investigation and calculation of sedimentation rates based on decompacted 3D depth data. These, in turn, enabled the reconstruction of margin development. This includes Messinian-earliest Zanclean NNE-SSW sinistral strike-slip faulting followed by Zanclean-Late Gelasian syn-depositional folding striking in the same direction. Abrupt change is marked by the Top Gelasian surface that shows indications of regional mass slumping. Successive Mid-Late Pleistocene progradation marks a basinward shift of the depocenter. Progradation controls margin sedimentation rates during the mid-late Pleistocene. These were found to increase throughout the whole Plio-Pleistocene, in contrast to reported sediment discharge from the Nile, which was shown to decrease after the Gelasian. Correlations to onshore findings, suggest that the continental margin records strain localization on the DSF during the Pliocene-Gelasian. This trend peaked at 1.8 Ma when short wavelength strain ceased along the margin, and differential subsidence commenced basinwards. This is attributed to consequent deepening of the DSF plate boundary.