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Quantitative Meso-Cenozoic Development of the Eastern Central Atlantic Continental Shelf, Onshore Agadir Basin, Western Morocco

The Agadir Basin provides a 116 km long transect through the Meso-/Cenozoic succession of the eastern Central Atlantic continental shelf. Its development included five stages: (1) rift initiation, late Permian to top Anisian, 259-234 My; (2) rift climax, Ladinian to top Carnian, 234-221 My; (3) postrift, Norian to top early Hettangian, 221-204 My; (4) early drift, mid-Hettangian to top Tithonian, 204-144 My, S1 to M19; (5) mature drift, Berriasian to top Eocene 144-33 My, M19 to C13. Flexural basin modelling (29 time layers) reveals eight subsidence trends of 10-35 My duration each which are characterized by initially low to zero subsidence/uplift, followed by a gradual increase in subsidence to maximum rates. The bases of subsidence trends correlate with major plate-tectonic reconfigurations, changes in seafloor spreading rates and shifts in the spreading axis within the Central and Northern Atlantic domain. Once tectonic subsidence increased after plate-tectonic reconfigurations a positive backfeed process between sediment flux, flexure- and compaction-induced subsidence was initiated. Numerical basin modelling shows, that two basic requirements for the analysis of eustatic sea-level changes at passive continental margins can not be applied to the Northwest African continental margin: (1) variations in sediment flux were too high to assume, that stratal patterns reflect exclusively changes in accommodation space; (2) tectonic and total subsidence/uplift rates varied between +131 and -13 mm/ky during the early and mature drift basin stages. Improved approximations of the timing and amplitudes of eustatic sea-level changes require integrated modelling of passive continental margins in different oceanic domains.