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**UPLIFTED MARINE TERRACES IN NORTHEASTERN CONTINENTAL MARGIN OF
THE ARABIAN PENINSULA, OMAN**

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ABSTRACT

North-eastern Arabia was a passive margin from the Permian until the late Cretaceous. In the late Cretaceous, the Semail Ophiolite underwent obduction for a distance exceeding 400 km in a south-western direction. Subsequently to obduction, continental shelf carbonates accumulated unconformably to autochthonous and allochthonous rocks (Semail Ophiolite) from the end of Maastrichtian until the mid-Eocene. Here, we present a geodynamic model for the poorly understood Late Cretaceous to Quaternary uplift of eastern Arabia, based on multi-proxy detailed analyses.. With this work we present a post-obductional geodynamic model to advance the existing regional models of the resumed subducting Arabian plate in the



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Makran subduction zone. To analyse the elevated ~150-km-long margin of north-eastern Oman, we rely on imaging geodesy, geomorphology, dating, and fault analyses. In general, geomorphological, and stratigraphical analyses document that the area was heterogeneously uplifted following the late Cretaceous. Ground displacements by Interferometric Synthetic Aperture Radar (InSAR) documents a heterogeneous ongoing uplift at approximately 1.3 mm/a. A complex, differential, and compartmentalized (“block-like”) uplift history is proposed, instead of a uniform uplift of the subducting margin. Thus, a differential and compartmentalized (“block-like”) uplift history of the studied passive margin is proposed. Post-mid-Eocene uplift is a combination of (1) the return flow of the viscoelastic Arabian mantle due to post-obduction denudation and (2) the convergence between Arabia and Eurasia and/or India, which reactivated pre-existing faults. The blocks’ disjunct uplift is confined by “blind” and major exhumed faults in which their activity has created a wide relief variability and contrast geomorphology. This is supported by the fact that the north-eastern Oman margin exhibits unusually high late Pleistocene (<40 ka) uplift rates at an average of ~2.8 mm/a in younger terraces while for older terraces (>40 ka) the uplift rate is distinctly lower (<1 mm/a).

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