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# Structural analysis and low-temperature thermochronometry across the internal part of the Makran accretionary prism, Iran

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The Makran accretionary wedge results from the convergence between the Arabian and Eurasian plates since at least the Cretaceous. It is growing seawards by frontal accretion and underplating of trench-fill sediments since the mid-Miocene, presently at a rate of about 2 cm.y$^{-1}$. Nowadays, the frontal 100–150 km are submarine and $>$350 km of the Cenozoic accretionary wedge are exposed on land, in Iran and Pakistan. New mapping results and structural sections document the structural development of the accretionary wedge.

Eocene-Oligocene turbidites with typically rhythmic alternation of brown sandstone and lighter-coloured shales are widespread in the internal part of the wedge. They apparently coarsen upwards and generally represent relatively distal slope deposits. Towards the Lower Miocene the deposits become more proximal and the influx of turbidites ceases. Carbonate reefs and gypsiferous mudstones indicate a shallow marine and lagoonal environment during the Burdigalian. Shortening in the internal Makran is accommodated along large E-W trending thrusts and by strong folding and layer-parallel faulting of the turbidite units. Low-temperature geochronology (apatite and zircon fission track ages) provides new time constraints. Preliminary apatite cooling ages indicate that exhumation of these units occurred between ca. 9 and 15 Ma ago. The turbidites are covered over a large area by olistostrome deposits. The size of, locally hundreds of meters large, exotic blocks suggests that these olistostromes are Neogene equivalents of the Holocene Storegga and Hinloopen slides on the Norwegian margin. At least one of these catastrophic events, dated Serravalian-Tortonian, filled the existing topography in the study area. Fluviatile and estuarine clastics in-

dicate that the internal Makran has emerged above sea-level since the Late Miocene. Folding of these units indicates that shortening continued until at least the Pliocene. The coastal Makran is largely covered by Upper-Miocene-Pliocene neritic clastics that are gently folded, forming large wavelength–small amplitude synclines and tight anticlines.