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Quaternary terraces: A key to understand the interplay between tectonics and surface processes in Makran accretionary wedge in SE-Iran

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We document the four most important drainage basins of the Iranian Makran and their fluvial terraces to investigate the surface record of the on-going Makran subduction zone. We compare stream profiles extracted from Aster Digital Elevation Model using a slope-area model for the main channel of each catchment.
The five studied rivers are transverse and flow from the northern crest line of the accretionary wedge to the coastal plain, in the south. The channel-profiles demonstrate that most of the rivers are out of equilibrium, showing equilibrium only in short segments of their longitudinal profile. We used SL map (Stream-Gradient Indices) to extract information on tectonic perturbations. High SL values mostly occur on the hanging walls of the main thrust faults that affect the inner Makran accretionary wedge. All knickpoints coincide with tectonic structures, knickpoints that can be tracked in the downstream of all studied rivers excepted. These knickpoints stand on the same topographic contour line and display same shape and size; they are interpreted as marking a base level fall event. The results from slope-area data, steepness index (Ks) and concavity index suggest a spatially variable surface uplift.
Five terrace levels can be traced regionally in all studied catchments. Mapping of these terraces, complemented by information from aerial photos, topographic maps and height correlation, reveals an eastward increase in numbers and incision depth over the wedge.
Field observation and the morphometric analysis indicate that tectonics have a stronger impact than climate on the genesis of fluvial and alluvial deposits.
Temporal correlation of these five levels, using terrestrial cosmogenic nuclides (TCN) dating method, is in progress.