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Shale-related minibasins atop a massive olistostrome in an active accretionary wedge setting: Two-dimensional numerical modeling applied to the Iranian Makran

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Minibasins are sagging synformal depocenters surrounded by upsurging ductile material. They are traditionally related to salt tectonics. The onshore Iranian Makran accretionary wedge exhibits closed minibasins developed onto a regional-scale olistostrome with a shaly matrix. Two-dimensional numerical experiments were carried out to investigate whether the growth of such minibasins above a shale-dominated unit is feasible and how the presence of a regional, shale-dominated olistostrome may affect the structural evolution of active accretionary wedges. Model results indicate that rapid mass-flow emplacement triggers thickening of the rear of the wedge while minibasins grow in a more frontal, tectonically quiet region. Further wedge growth leads to a jump forward of frontal accretion. Compared to the case history, this jump would explain the structural characteristics of the Coastal Makran in Iran.