

عنوان مقاله:

Analogue Experiments of Subduction VS. Collision Processes: Insight for the Iranian Tectonics

محل انتشار:

فصلنامه زلزله شناسی و مهندسی زلزله، دوره 7، شماره 3 (سال: 1384)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

The behavior of subduction-collision transition is investigated, using laboratory experiments. These experiments help understanding the tectonics at the transition between the Zagros collision ranges and the Makran emerged accretionary prism in southeastern Iran. Lithospheric plates are modeled by sand-silicone plates floating on glucose syrup, and the density contrast between oceanic and continental lithospheric plates and asthenosphere is reproduced. Analogue experiments model the convergence between two lithospheric plates, a small continent indenting a large continental plate. These experiments provide evidence for surface deformation in front of the indenter and above the oceanic subduction zone that depend on the behavior of the slab below the collision zone. Slab break-off following the subduction of the small continent favors the indentation process, because it results in an increasing compression in front of the indenter, and extension above the neighboring oceanic subduction, both of them being responsible for the appearance of the indenter-like geometry of the plate boundary. When the slab does not deform significantly at depth, in contrast, the closure of the oceanic domain in front of the indenter is followed by a longer period of continental subduction, during which the tectonic regime within the large continent remains quite homogeneous. In south-east Iran, the transition between Zagros and Makran is accommodated over a large area, from the Hormoz strait to the East-Iranian ranges; it suggests that the slab is continuous at depth. On the contrary, the Chaman fault zone between Makran and Himalayas is a narrow zone and is clearly related to a tear away of the underlying slab.

کلمات کلیدی:

Iran, subduction, Collision, Analogue Experiments, Tectonics, Zagros, Makran, Break-off, Lithosphere, Continent

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