



Observations on how does the continental crust thin and break-up in the eastern Gulf of Aden (Oman/Socotra)

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Reflection seismic lines and seismological investigations across conjugate margins of the Oman/Socotra margins allow a detailed description of the crustal structure and a discussion on the structures and the age of the deformation. Analysis of the full dataset enables mapping the area where the continental extension seems to be coupled to the mantle illustrating the exhumation phase. The crustal thinning is abrupt occurring mostly at the shoreline on both margins and shows along-margin variations. The receiver functions computations show that the western part of Socotra correspond to an outcropping necking zone whereas the eastern part to the proximal part. The thinning progressively migrates towards the locus of final breakup, which is interpreted by a progressive weakening of the mantle by lithospheric thinning and exhumation process. Then, a stage of uplift and erosion is observed in the proximal margins after the thinning phase. Uplift is usually higher where crustal thinning is more important in the deep basin, which could be interpreted by the onset of small-scale convection driven by the lateral temperature gradients at the necking zone.