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At the tip of a propagating rift - The offshore East African Rift

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Numerous studies have addressed various aspects of the East African Rift system (EARS) but surprisingly few the offshore continuation of the south-eastern branch of the rift into the Mozambique Channel.
Here, we present new evidence for neotectonic deformation derived from modern seismic reflection data and supported by additional geophysical data. The Kerimbas Graben offshore northern Mozambique is the most prominent manifestation of sub-recent extensional deformation. The seismic reflection data reveals that recent normal faulting often utilizes preexisting, deeply buried half-graben structures which likely are related to the formation of the Somali Basin. The ∼30 km wide and ∼150 km long symmetric graben is in a stage where the linkage of scattered normal faults already did happen, resulting in increased displacement and accommodation of most of the extension across the basin. However, deep earthquakes below the rift indicate a strong and still preserved lithospheric mantle. Extension is becoming diffuse where an onshore suture, subdividing the northern from the southern metamorphic basement onshore Mozambique, is closest to the offshore rift. It appears likely that this suture is the origin for the variation in rifting style, indicating that mantle fabric resulting from a Cambrian collision has been preserved as mechanical anisotropy of the lithospheric mantle. Further south the rift focuses in an about 30 km wide half-graben.
An important finding is that the entire offshore branch of the EARS lacks significant volcanism. Along the offshore EARS there are only negligible indications for recent volcanism in the reflection seismic data such as sills and dikes. Apparently the "Comoros mantle plume" (French and Romanowicz, 2015) has a very minor influence on the progressive extensional deformation along the northern Mozambique continental margin, leading eventually to breakup sometimes in the future.
Combining structural with earthquake data reveals that the magma-poor offshore rift is in a stage where mainly the lithospheric mantle is extended but not yet broken.