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Neogene rift tectonic activity in the West Somali Basin, offshore Tanzania: example of a segmented oblique rift structure.

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Little is still known about the structural fabric of a potential continuation of the East African Rift System (EARS) offshore Tanzania in the West Somali Basin. This continuation has been established mostly through sparse GPS measurements, earthquake slip vector data, spatial distribution of teleseismically detected earthquake focal mechanisms, and some recent seismic reflection data. West of the Davie Ridge (which part of a larger structure named the Davie Fracture Zone) and across its northern extension, regional seismic reflection profiles indicate the occurrence of continental - oceanic crust transition, which is characterized by early Cretaceous reverse faulting localized along deformation corridors. After the Aptian, the seafloor spreading ceased and the Tanzania margin evolved into a passive margin dominated by clastic deep-water deposition. In this contribution, we describe some results obtained from structural mapping of a 3D seismic dataset, calibrated by few explorations well, covering an area located between the Davie Ridge and the continent, south of Mafia Island. The seismic data maps suggest a major structural style change across the Neogene that is still active today. The recent structures are represented by two main interacting fault trends: some NS boundary faults corridors and a NW-SE internal arcuate segmented fault, both depicting a widely and diffused distribution of normal fault (with an overall cumulative amount of horizontal brittle extension ranging between 5 to 10 km). Some of the largest faults appear to reactivate older extensional structures but the general absence of growth faults cutting across the Paleo-Neogene depositional units suggest very recent rift re-activation. The recent rift system appears to show a component of obliquity with respect to the orientation of the Davie Ridge, and to the onshore structure related to the EARS tectonics.