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The African Plate: A history of oceanic crust accretion and subduction since the Jurassic

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Initially part of Gondwana and Pangea, and now surrounded almost entirely by spreading centres, the African plate moved relatively slowly for the last 200 million years. Yet both Africa's cratons and passive margins were affected by tectonic stresses developed at distant plate boundaries. Moreover, the African plate was partly underlain by hot mantle (at least for the last 300 Ma) - either a series of hotspots or a superswell, or both - that contributed to episodic volcanism, basin-swell topography, and consequent sediment deposition, erosion, and structural deformation.

A systematic study of the African plate boundaries since the opening of surrounding oceanic basins is presently lacking. This is mainly because geophysical data are sparse and there are still controversies regarding the ages of oceanic crust. The publication of individual geophysical datasets and more recently, global Digital Map of Magnetic Anomalies (WDMAM, EMAG2) prompted us to systematically reconstruct the ages and extent of oceanic crust around Africa for the last 200 Ma. Location of Continent Ocean Boundary/Continent Ocean Transition and older oceanic crust (Jurassic and Cretaceous) are updates in the light of gravity, magnetic and seismic data and models of passive margin formation. Reconstructed NeoTethys oceanic crust is based on a new model of microcontinent and intr-oceanic subduction zone evolution in this area.The new set of oceanic palaeo-age grid models constitutes the basis for estimating the dynamics of oceanic crust through time and will be used as input for quantifying the paleo-ridge push and slab pull that contributed to the African plate palaeo-stresses and had the potential to influence the formation of sedimentary basins.