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The lithospheric structure of Africa: Geoid, Elevation and crustal thickness.

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Despite increasing efforts in seismic surveying and geophysical studies to unravel the structure of the African lithosphere, vast areas of the African continent, especially in the central part, still lack reliable data on Moho and LAB depth. As Africa offers provoking conditions to investigate the relation between deep and upper mantle thermal and/or compositional anomalies and its anomalous regional long wavelength topography we present insights into the continent's crustal and lithospheric thickness. For this purpose we address the 1D study of the detailed structure of the African lithosphere (Moho and LAB geometry) applying a four-layered model composed of crust and lithospheric mantle plus sea water and asthenosphere, assuming Airy isostasy and using, as constraints, elevation, geoid and thermal data. Furthermore, to better verify the crustal thickness model we test it against a comprehensive compilation of existing Moho depth estimates from active and passive seismic studies across the continent. Additionally existing models of thermo-tectonic age of crust, sediment thickness and the thermo-chemical state of mantle domains from global and regional tomography are used to discuss the strongly debated processes responsible for the today's bimodal distribution of basin-and swell topography.