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Data based 3D modelling of the southwest African continental margin

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The volcanic passive continental margin of southwest Africa was formed in consequence of rifting and continental break-up of Gondwana in the Late Mesozoic. Our study focusses on an area extending from the Walvis Ridge in the north to the Agulhas Falkland Fracture Zone in the south including some important petroliferous sedimentary basins such as the Walvis Basin, the Luderitz Basin, and the Orange Basin. Due to decades of industrial exploration and scientific research, some of these areas reveal a large pool of structural and geophysical data. Thus, much is known about the individual tectonic and depositional histories of several subdomains of the area. The goal of our study is to understand the margin in its entirety.
We present a 3D model of the present-day configuration of the southwest African continental margin. This model integrates well information, seismic reflection and refraction data, a previously published 3D structural model (Maystrenko et al., 2011), as well as freely available global data sets on the crustal structure (e.g. crust2.0 of Bassin, Laske & Masters, 2000). To extrapolate local information on crustal thickness (respectively the depth of the Moho) across the whole margin, we perform 3D gravity modelling using the software IGMAS+ (Götze & Schmidt, 2010; Schmidt et al., 2011). As parts of the first results, we show margin-wide depth and thickness distributions of a Palaeozoic to Cenozoic sedimentary layer and a Paleoproterozoic to Mesozoic crystalline crustal layer.

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