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Subsidence analysis of the South Atlantic passive margins

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To understand the subsidence history at passive margins we assess the first-order configuration of the sediments, crust and upper mantle combining data on the geometry and distribution of physical properties into basin-scale data-based, 3D structural models of the Southwest African and Southeast American continental margins. The latter image the present-day state of the margins and are additionally constrained by, 3D gravity and 3D thermal modelling. Subsequently these lithosphere-scale structural models are used as a base for subsidence reconstruction using different assumptions and backstripping techniques. All resulting models consider removal of the load-induced subsidence components, isostatic compensation and decompaction while they differ in using additional constraints and concepts. Information on paleo water depth is sparse especially where sediments are mainly composed of clastics, or may be restricted to a few regional unconformities. Therefore we have tested the restoration of the thermal subsidence that cumulative crustal stretching may have caused. Subtracting the subsidence induced by the sediment load and the thermal subsidence from the total subsidence yields the residual topography that can be directly compared to paleo water depth information where available and allows quantifying the initial “tectonic” subsidence.