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## The origin of elevated plateaus along passive continental margins

Johan M. Bonow<sup>1</sup>, Peter Japsen<sup>2</sup>, Paul F. Green<sup>3</sup>, and James A. Chalmers<sup>2</sup>

<sup>1</sup>Geovisiona AB, Bro, Sweden (johan.bonow@geovisiona.com)

<sup>2</sup>Geological Survey of Denmark and Greenland (GEUS)

<sup>3</sup>Geotrack International

Many passive continental margins around the world are characterised by elevated plateaus at 1 to 2 km or more above sea level cut by deeply incised valleys and commonly separated from an adjacent coastal plain by one or more escarpments. Mesozoic–Cenozoic rift systems parallel to the coast are commonly present offshore with a transition from continental to oceanic crust further offshore. These landscapes occur in arctic, temperate and tropical climate and in different geological settings independent of the time span since break-up (e.g. along the Atlantic from south to north).

The plateaux are typically more than 100 km wide, much larger in some cases, and extend hundreds of kilometres along the margin, cutting across bedrock of different ages and resistances. The key to understanding the formation of regional, low-relief erosion surfaces is the base-level, as this is the level to which fluvial systems grade the landscape. The most likely base level is sea level, particularly for locations along continental margins during the post-rift development of passive margins.

It is commonly assumed that the characteristic, large-scale morphology of elevated, passive continental margins with high-level plateaux and deeply incised valleys persisted since rifting and crustal separation. Further, it is assumed that the absence of post-rift sediments is evidence of non-deposition, despite continental-stretching theory predicting deposition of a thick post-rift sequence overlying both the rift and its margins.

However, our studies of the passive continental margins of West and East Greenland, Norway, NE Brazil and southern Africa provide evidence of km-scale, post-rift subsidence and that the plateau surfaces were graded to sea level long after break-up and subsequently lifted to their present elevations. In some of these cases, the presence of post-rift marine sediments at high elevation provide direct proof of this interpretation. Since elevated plateaux cut by deeply incised valleys are a characteristic feature of these and other margins, this similarity suggests that such topography elsewhere in the world may also be unrelated to the processes of rifting and continental separation. We present a wide range of evidence from passive margins around the world in support of this hypothesis,

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