

## **Depth-Dependent Stretching of the Paired Atlantic Margin Basins of Equatorial West Africa and Northeast Brazil**

<sup>1</sup> TURNER, J.P., <sup>2</sup> ROSENDAHL, B.R. and <sup>1</sup> WILSON, P. G.<sup>1</sup>  
University of Birmingham, School of Earth Sciences, Birmingham  
B15 2TT, UK; <sup>2</sup> Rosenstiel School of Marine and Atmospheric  
Sciences, University of Miami, 4600 Rickenbacker Causeway,  
Miami FL 33149, USA

Key observations from West Africa and its conjugate margin in NE Brazil indicate that Cretaceous lithospheric extension was accommodated by depth-dependent stretching: (a) structural asymmetry of the rift basins, interpreted as an expression of crustal-scale simple shear; (b) landward-dipping extensional duplex underlying highly stretched lower crust beneath the Gabon margin indicates that east-directed lower crustal (ductile) simple shear was important. Collation of available data from beneath the Aptian salt suggest that syn-kinematic subsidence and sedimentation offshore Gabon and Equatorial Guinea was modest, again consistent with the idea of preferential stretching in the lower crust and lithospheric mantle; (c) 'missing' post-kinematic succession in the exhumed Recôncavo-Tucano-Jatobá (R-T-J) basin system, NE Brazil accords with a model in which preferential upper crustal extension leads to enhanced kinematic subsidence, but without significant post-kinematic thermal relaxation of the deeper lithosphere; and (d), a pronounced post-Cenomanian (end-kinematic) unconformity in West Africa records massive uplift and erosion (>1km section removed) immediately prior to ocean opening, interpreted as an expression of uplift and erosion above a region of preferential ductile extension in the deeper lithosphere.

This talk brings together interpretations from mapping of commercial seismic reflection data from the Gabon-Equatorial Guinea-Cameroon margin, from new apatite fission track data from the R-T-J basin system, and from the deep-imaging (20s TWT) *PROBE* seismic dataset. The newly reprocessed *PROBE* data are providing among the clearest images available of the structural configuration of the ocean-continent boundary and the nature of the lower crust and lithospheric mantle beneath highly stretched rifted continental margins.