



Seismological constraints on lithospheric structure beneath rifted margins

Stewart Fishwick

University of Leicester, Geology, Leicester, United Kingdom (sf130@le.ac.uk)

There is considerable variation in both topography and crustal architecture along passive margins worldwide. However, the variations in lithospheric mantle structure are less well studied. This is, perhaps, in part due to the technical challenge for offshore-onshore passive seismology and also the lower resolution obtained in most mantle studies, particularly when compared to detailed imaging of the crust available from reflection seismology.

The available large scale observations of mantle structure (predominately from surface waves), and crustal structure (from receiver functions) for the continental region adjacent to the margins are reviewed. Results for Africa and Australia show clear correlations between the mantle structure and the present day topography of the margin, and this relationship is explored from a worldwide perspective. Seismic studies can also provide information on lithospheric thickness at the margin, which can be used as an additional constraint for the thermal modelling of basin structure. In this case the limitations include the depth resolution of the method, and the particular proxy used to extract a lithospheric thickness estimate from a seismic model.

Perhaps most importantly, is to remember that these seismological observations tell us only the existing structure. The challenge remains how to decipher whether the present structures relate to inherited pre-rift architecture; to alteration of lithospheric mantle during rifting, or to much later post rift changes associated with separate tectonic events.