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Studying the Antarctica-Australia rifted conjugate margins using multichannel seismic reflection data.

P.E. Guerrero (1), C.R. Ranero (2), L. Mitrovic (3), N.G. Direen (3), H.M.J. Stagg (4), and M. Perez-Gussinyé (5)

(1) Institut de Ciències del Mar- Centro Superior de Investigaciones Científicas (CSIC), Barcelona, Spain., (2) ICREA at Institute of Marine Sciences, CMIMA (CSIC), Barcelona, Spain, (3) Continental Evolution Research Group, School of Earth and Environmental Sciences, University of Adelaide,Australia, (4) Geoscience Australia, Camberra, Australia., (5) Institut de Ciències de la Terrra, Jaume Almera. Barcelona,Spain.

We have studied the structure of the pair of conjugated rifted non-volcanic margins of Antarctica and Australia with deep penetrating multichannel seismic reflection data.
The data were acquired by Geoscience Australia (GA) during surveys GA-228 and GA-199. Line GA-228_24 is 352 km long, running across the continental margin of Wilkes land (Antarctica), it was collected with an air-gun array of 60 l and recorded on a 3.6 km long, 288 channels streamer. Line GA-199_05 is 286 km long, crossing the conjugate margin of the Great Australian Bight. The line was collected with a sleeve-gun array of 49 l and recorded on a 4 km long, 320 channels streamer.
The seismic reflection lines have been processed to 14 s two-way time (TWT) and display the structure of the entire crust. Processing includes multiple attenuation, deconvolution and a post-stack finite differences time migration. Pre-stack depth migration of the lines is underway.
The margins formed during rifting of Australia and Antarctica from about Callovian (164 Ma) to Aptian time (125Ma). Both margins displays three sectors from clear continental to oceanic crust. Comparable sectors display similar tectonic structure, sedimentary units and crustal thickness in both margins.
Under much of the roughly 100-km-wide slope of both margins, a strong and fairly continuous reflection at 9.5 - 11.5 s TWT is interpreted as marking the continental Moho. Here, the top of the crystalline basement is interpreted as a indistict and smooth surface. Overlying the basement is a package of discontinuous reflections cut by numerous faults and bounded above by an erosional unconformity. This unit thins seaward, and contains internal angular unconformities, and strata locally thickens toward faults, thus possibly representing syn-rift sediment with perhaps some pre-rift sediment at the base. The entire a package and locally, indicating that it formed syn-rift. A seaward thickening postrift sediment pile overlies the synrift.
The next sector extends about 100 km under deep basin floor. The base of the crust is not well displayed and may locally be imaged as discontinuous reflection at about 9-10 s TWT. If this interpretation is correct that crust is a few km thick. Crystalline basement is characterized by numerous small titled blocks bounded by normal faults dipping seaward and overlaid by tilted syntectonic sediment piles 1-2 km thick. This sector is interpreted as a broad Continent – Ocean Transition (COT).
Seaward extends a sector with basement bounded above by a continuous and bright reflection. Blocks bounded by normal faults are not uncommon butare not overlaid by clear syntectonic sediment piles, and all sediment appears to be postrift . We interpret this part as oceanic crust.