

Zhang, H., Bird, D. E., and Mann, P., 2020, Deep crustal structure of the Sergipe-Alagoas rifted-passive margin, northeastern Brazil based on deeply-penetrating reflection data and 2D gravity modeling (abstract): *Eos, Transactions, American Geophysical Union, Fall Meeting Supplement*, v. 101, NS008-08.

The Sergipe-Alagoas Basin is a Cretaceous rifted-passive margin basin located along the northeastern Brazilian margin of the South Atlantic Ocean. The structural framework of this region is controlled by Aptian normal fault systems striking NE-SW and subsidiary E-W and NW-SE faults, interpreted as transfer faults that connect normal fault segments. We investigate the crustal architecture and the nature of the continental-oceanic boundary (COB) of the Sergipe basin by building regional, 2D gravity models (A-A' and B-B') based on colinear PSDM seismic lines that penetrated to a depth of 40 km. Additional constraints on the gravity models are provided by deep exploration wells, density values from lithologic units penetrated by these wells, and previous refraction studies. Gravity and magnetic data were integrated with seismic controls in order to extend both gravity models 200 km to the east across the onland and mountainous Reconcavo–Tucano–Jatoba rifted basins. Model A-A' is oriented NW-SE through the central Sergipe Basin and the Sergipe Fracture Zone to the northwest. Model A-A' crosses the Bahia Seamounts of 114Ma to the southeast, which was rooted up to 22 km into the upper mantle. Oceanic crust in this hotspot-affected area is 40% thicker compared to the unaffected area of Model B-B'. Model BB', oriented NW-SE through the southern edge of the Sergipe Basin and the northern edge of the Jacuibe Basin, shows a better-defined Moho, 100 km wide zone of ultra-thin (10 km) continental crust, and well-defined continent-ocean boundary. The upper oceanic crust was characterized by a zone of seismic transparency, which was interpreted to be sheeted dikes and uppermost gabbros of the lower crust. The lower crust is characterized by high-amplitude reflectors dipping landward and seaward. Lower crustal, high-amplitude reflectors are interpreted to be gabbroic dikes based on analogs in other areas. Both gravity models reveal seaward-dipping reflectors that filled the marginal rift separates continental crust from oceanic crust. These results provide important constraints on the crustal framework in the Sergipe Basin and its tectonic reconstruction.