

Dragoi, D., Hall, S. A., and Bird, D. E., 2006, **Geophysical investigation of continental margin development, and early spreading history of the South Atlantic south of the Walvis Ridge/Rio Grande Rise** (abstract): *Eos, Transactions, American Geophysical Union, Fall Meeting Supplement*, v. 87, G53B-0908.

Crustal models of the transition from continental (>30 km) to normal oceanic crust between 22°S and 32°S on the African side and from 28°S and 43°S on the S. American side have been constructed from extensive gravity and magnetic anomaly data together with more limited seismic reflection and refraction data. Offshore gravity highs related to major crustal thinning can be followed along each margin. A smaller, more seaward gravity high observed on the African side coincides with previously mapped magnetic anomaly M4 and appears to delineate the landward limit of normal oceanic crust. The transition zone width is relatively uniform  $\sim 320 \pm 30$  km on the African margin but increases southward from  $\sim 300$  km to >400 km on the S. American side. The zone of magmatic underplating beneath the thinned crust has a uniform width of  $\sim 200$  km on the African side but is somewhat narrower ( $\sim 130$  km) and also decreases southwards on the S. American side. Seafloor spreading magnetic anomalies C31 to C34, and M0 to M4 have been identified on both sides. Distinctive C34 anomalies can be clearly correlated except where masked by large amplitude ( $\sim 1000$  nT) anomalies produced by seafloor topography of the Walvis Ridge. C34 spreading rates are slightly asymmetrical with 42 mm/yr on the S. American side compared with 38 mm/yr on the African side. M0 to M4 anomalies are more difficult to identify and reliably correlate over each margin. M0-M4 spreading appears to be asymmetric with more rapid spreading on the S. American side. The C34-M0 distance is noticeably larger on the S. American side suggesting that asymmetrical spreading may continue into the Cretaceous Quiet Zone. A more probable explanation for the asymmetry is that one or more ridge jumps occurred between 84 and 120 Ma. Residualized free air satellite gravity data have been used to delineate fracture zones (FZs) associated with the early opening. More than 10 flow lines determined from these FZs intersect the mapped C34, M0 and M4 isochrons. The FZs and isochron data have been used to compute corresponding stage poles for C34, M0 and M4, which have been used to develop a more detailed early opening history for the region.