

Hall, S. A., Bird, D. E., Danque, H. A., Grant, J. V., McLean, D. J., and Towle, P. J., 2014, **New constraints on the age of the opening of the South Atlantic basin as revealed by recently acquired magnetic, gravity and seismic reflection data** (abstract): Eos, Transactions, American Geophysical Union, Fall Meeting Supplement, v. 94, T52C-03.

Detailed, high quality, marine total field magnetic data has been recently acquired over parts of the South Atlantic ocean off the southwestern margin of South Africa. These data display a pattern of well-defined, NW-SE striking linear magnetic anomalies along the margin that can be traced with confidence over distances > 150 km. The anomalies are interpreted to be M-series seafloor spreading anomalies M9 to M11, which are consistent with the initiation of seafloor spreading around 135 Ma (Late Valanginian). Corresponding M-series anomalies M9 and M10 have previously been reported for the conjugate South American margin offshore Argentina, however the presence of the M11 series SE of the Cape Lineament suggests an earlier opening of the southern South Atlantic basin than previously recognized. Breaks in the continuity of the linear anomaly pattern, observed in map view, have generally NE-SW trends and are considered sites of possible fracture zones. One such discontinuity, which we have termed the "Cape Lineament" (CL), marks a significant change in crustal character and Cretaceous depositional history, as revealed by gravity data and seismic reflection data respectively. Crust NW of CL appears to be characterized by greater thicknesses and the presence of seaward dipping reflectors (SDRs), whereas crust SE of CL has more "normal" oceanic thicknesses and SDRs that are either absent or more limited in areal extent. Although linear magnetic anomalies are observed both NW and SE of CL, anomalies to the SE display a better correlation with those predicted by our seafloor spreading model.