



## **The Pangean suture zone in southeastern New England, USA, and Morocco**

Yvette Kuiper (1), André Michard (2), Abderrahmane Soulaïmani (3), Etienne Ruellan (4), James Crowley (5), Faouziya Haïssen (6), and Hassan Ouanaimi (7)

(1) Geology and Geological Engineering, Colorado School of Mines, Golden, Colorado 80401, USA (ykuiper@mines.edu), (2) Earth Sciences Department, Université Paris-Sud - Orsay, 75002 Paris, France, (3) Faculty of Sciences Semlalia, Cadi Ayyad University, Marrakech, Morocco, (4) French National Centre for Scientific Research, Géosciences Environnement, Université Toulouse III - Paul Sabatier, 31400 Toulouse, France, (5) Geosciences, Boise State University, Boise, Idaho 83725, USA, (6) Faculté des sciences Ben Msik, Université Hassan II de Casablanca, Morocco, (7) Ecole Normale Supérieure, Cadi Ayyad University, Marrakech, Morocco

Pangea is generally thought to have broken up approximately along the suture zone that closed the Rheic Ocean during formation of the supercontinent. However, at the latitude of southern New England, USA, and Morocco, the suture zone may be preserved on land or on the continental shelf. Recently, a piece of Paleoproterozoic West African crust was recognized in the COST No. G-1 core in Georges Bank, offshore Massachusetts, USA. It is interpreted as having been transferred from the Anti-Atlas region of northwest Africa to North America during the formation and subsequent breakup of Pangea. The Pangean suture zone therefore must lie on the continental shelf or on land northwest of it.

Preliminary U-Pb zircon LA-ICPMS analyses from granite from the DSDP544 core granite of the Mazagan escarpment, offshore Morocco, ~300 km north of the Anti-Atlas domain, yielded a ~560 Ma crystallization age and abundant inherited zircon cores up to 620 Ma. Rare older inherited zircon cores yielded ~2.67, ~1.78 and ~1.20 Ga dates and no ~2.2-2.0 Ga dates, suggesting a non-West African origin. Thus, its origin is more likely to be Amazonian, specifically the (Amazonian) Avalon terrane of eastern North America. A charnockite, sample CZ91-5 (Cyamaz submarine campaign), taken from the Mazagan escarpment ~30 km SSW of DSDP544, was analyzed in the 1980's and yielded ~1000-900 Ma K/Ar dates. Rocks of that age are not known to exist in West Africa, and a possible origin may be the Grenville province of North America. These data suggest that the rocks of the Mazagan escarpment were rifted off North America during the breakup of Pangea, and that the Pangean suture zone lies on the Mazagan Plateau southeast of the escarpment or on land in Morocco.

Thus, while at the latitude of southern New England and the Anti-Atlas region, part of West Africa was transferred to North America, at the latitude of the Mazagan Escarpment and northern Nova Scotia in Canada, part of North America may have been transferred to West Africa. The Pangean suture zone may thus be exposed in southeastern New England and/or in Morocco.