

UPLIFT AND EROSION IN THE BORBOREMA PROVINCE, NE BRAZIL: INSIGHTS FROM APATITE FISSION TRACK ANALYSIS

1MORAIS NETO, J.M., 2HEGARTY, K., 3ALKMIM, F., 1MATOS, R. and 4KARNER, G.
1PETROBRAS, Natal, Brazil; 2GEOTRACK, Brunswick West, Australia; 3UFOP, Ouro Preto, Brazil; 4LDEO, Palisades, USA

Several evidences indicate that the Borborema Province, northeastern Brazil, underwent important epeirogenic movements after the break-up of Gondwana. Results of nineteen Apatite Fission Track Analysis (AFTA) carried out in Late Paleoproterozoic to Early Tertiary rocks samples, collected along two regional transects across the Borborema Province, indicate two episodes of cooling. AFTA data of both transects show evidence for a first cooling event beginning between 100 and 90 Ma, and a second, Late Tertiary cooling episode between 20 and 0 Ma. The distribution of AFTA data suggest that both events have a regional expression and could be interpreted as a result of regional uplift and consequent erosion. The first event postdates the main episode of rifting of the Eastern and Equatorial Brazilian margins and should be related to a kilometer-scale uplift of the South American Plate, associated with the post-rifting stage along the Brazilian Atlantic margin. The second event is likely to be related to a thermally driving process associated with an Eocene-Miocene magmatic activity in northeast Brazil. Some authors have attributed the Tertiary magmatism to a hot mantle plume. Variation in the regional in-plane stress field, associated with transient plate reorganization, would have also contributed to amplify the uplift, whose effects exerted important control on the regional geomorphology. Tertiary sediments preserved on the highlands of the Borborema Plateau and an increase in the clastics discharge into the offshore Potiguar Basin, since the Miocene, are strong evidences of significant uplift pulses affecting the Borborema Province during the Cretaceous and the Tertiary.