

Magnetic and gamma-ray spectrometry signatures from terranes, lineaments and granitoid rocks belonging to the Proterozoic structural Borborema Province, Northeast Brazil

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A recently compiled total field magnetic-anomaly map of the Borborema Province demonstrates that structural lineament and tectonostratigraphic terranes have strong affinity with lineaments and magnetic patterns. The structural lineaments are long shear zones characterised by magnetic alignment and in some cases are associated to gravity dipole anomalies. The tectonic framework consists of a tectonostratigraphic terrane mosaic. These terranes were put together by shear mechanisms. In the north domain, the magnetic pattern is dominated by linear and shallow-seated anomalous bodies separated by non-magnetic supracrustal belts and granitized crust. In a more tectonically complex region this domain has northeast-trending magnetic boundaries that separate belts with sharp change in the magnetic properties. The central domain has northeast-trending boundaries and the magnetic signatures have sources in non-magnetic supracrustals and granites. The south domain shows magnetic signatures originated from Archaean nucleus separated by supracrustals and non-magnetic granitized crust. The results of airborne gamma-ray spectrometry surveys show that Neoproterozoic granitoid suites produce strong radiometric signals. Magnetic rocks enriched in U and Th constitute the shoshonitic suite. The peraluminous suites are non-magnetic rocks with depletion in U and Th and higher U/Th ratios. Non-magnetic rocks depleted in Th constitute K-rich calc-alkalic metaluminous suites. This study provides a new contribution to the geotectonic model evolution of the Borborema Province.