

SEISMIC AND AEROMAGNETIC EVIDENCE OF AN EARLY PALEOZOIC DEXTRAL STRIKE-SLIP RIFT SYSTEM ALONG THE TRANSBRASILIANO LINEAMENT IN THE EASTERN PORTION OF PARNAÍBA BASIN, NE BRAZIL.

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ABSTRACT: The interpretation of 2D seismic reflection profiles, supported by aeromagnetic and surface geological data, in the eastern portion of Parnaíba Basin, NE Brazil, reveals a set of narrow NE-SW elongated grabens along the Transbrasiliiano Fault Zone (TBFZ), possibly coeval to the Cambro-Ordovician Jaibaras graben (JAG), in Ceará state. These troughs are discontinuous and possibly connected thru ENE-WSW transference zones, along which polarity changes of the major bounding faults were accommodated. The best imaged trough in the seismic data is here named as the Jerumenha graben (JEG), reaching approximately 3 km of maximum thickness in the vicinities of the homonymous town in Piauí state. JEG is controlled by a major bounding normal fault located in its SE limit, which coincides with a strong NE-SW positive anomaly associated to a magnetic lineament. The seismic character of the JEG infill is clearly marked by two levels of high amplitude continuous reflectors, truncated and rotated by minor synthetic and antithetic normal faults, and two thicker zones of low amplitude discontinuous to chaotic reflectors above each of these two levels. The seismic termination of shallow low amplitude reflectors indicates erosive and angular truncation of this rift sequence against the horizontal reflectors of the base of Serra Grande Group (Silurian), defining the Pre-Silurian unconformity as the top of this sequence. In the aeromagnetic map, the northern termination of the major JEG bounding fault is deflected to E-W direction, coinciding with a very strong E-W positive magnetic lineament, which seems to be connected to the Cococi graben, in the eastern margin of Parnaíba basin, in Ceará state. Northern to the E-W lineament, and along the TBFZ trend, there is another NE-SW elongated trough, called the Campo Maior graben (CMG), which is displaced to the west of the JEG depocenter and presents the main normal fault located in the NW boundary, opposite polarity from the one in JEG. Finally, further northwards, displaced to the eastern boundary of the TBFZ, there is the NE-SW Sobral-Pedro II fault, limiting the Jaibaras graben and indicating another polarity change of the main fault of the rift system. The geometric disposal of these troughs and the change in bounding fault polarity suggest that there was the installation of a dextral strike-slip rift system during the Early Paleozoic (Cambro-Ordovician), along the TBFZ. The seismic data also shows evidence of later compressional reactivation along these fault planes, which were already observed in the JAG area.

KEYWORDS: TRANSBRASILIANO LINEAMENT; PARNAIBA BASIN; EARLY PALEOZOIC