GEOPHYSICAL INVESTIGATION IN THE BASEMENT INLIER IN THE WESTERN PORTION OF THE SÃO FRANCISCO CRATON

Alves, Vitor A.; Vidotti, Roberta M.; Dantas, Elton L. - Programa de Pós-graduação em Geologia, Instituto de Geociências, Universidade de Brasília.

Abstract

The São Francisco Craton preserves records of Archean rocks that were reworked during the paleoproterozoic orogeny, responsible for the amalgamation of several crustal blocks. The Guanambi-Correntina Paleoplate is composed of the Cristalândia, Correntina and Porteirinha crustal blocks. The western portion of the São Francisco Craton is composed of pre-Cambrian crystalline basement, which constitutes the tectonic inlier of Correntina block, covered mainly by the Neoproterozoic and Phanerozoic sedimentary sequences of São Francisco Basin. In this context, magnetic and gravity data between the basement highs were compiled, processed and interpreted. Processing techniques were used to characterize the main subsurface structures, while providing information on the geometry of the basement and basins. The results of the magnetic data analysis allow separating the main lineaments with magnetic discontinuities into three tectonic domains: São Domingos, Posse, and Correntina. The analysis and interpretation of the matched filter in the magnetic data characterize three distinct depths interpret as: (i) shallow zone (1.6 km); (ii) intermediate zone (6.2 km) and (iii) deep zone (19.0 km). The result of the technique on gravimetric data generally presents deeper sources. The basement inlier represent a regional gravity anomaly that increases towards the east. The extracted magnetic lineaments predominantly NE-SW trending were interpreted as under the Transbrasiliano lineament influence zone. The Euler Deconvolution applied to magnetic data allowed to characterize dykes swarms NW-SE and E-W trending forming other important lineaments that recorded extensional events that could be related to development of the Espinhaço and São Francisco basins. The susceptibility model reaches depths of up to 13 km, with magnetic sources of high susceptibility in the upper regions of the basement of São Domingos and Correntina, possibly associated with small intrusive bodies. The 2.5D forward gravity modeling shows faults that limit the units of the basement highs, representing structures that reach the intermediate crustal level. Besides, in the model central portion, the subsidence that formed the Urucuia sub-basin caused the observed crustal thinning, allowing horsts and grabens to be generated during the opening of the South Atlantic, as well as the faults and fractures with the main NS tendency bordering the edge of the Serra Geral plateau.