ABSTRACT

A pervasive NS-EW pattern of structural lineaments on Brazilian terrains has been identified on remote sensing products. Such pattern can be found by cutting and controlling rocks as well as and structures from the Archean to the Paleozoic ages. These rocks have been under several deformation cycles. Those NS and EW structural lineaments exert paleogeographic, sedimentological and tectogenetical control over several litho-structural units. They appear in a subtle way in satellite images, as a direction of maximum density of other fractural patterns. The NS-EW pattern reveals its policyclic character and its influence on the strucutural evolution of the Brazilian craton.

1.0 INTRODUCTION

A research was carried out to analyse remote sensing data on tectonic, structural, paleogeographc and sedimentological control by the NS-EW directions over stratigraphic, litho-structural units of Archean; Lower, Middle and Upper Proterozoic; and Paleozoic ages.

Remote sensing products like MSS-RBV and TM-LANDSAT images at scales ranging from 1:500.000 to 1:100.000; aerial photographs at scales ranging from 1:100.000 to 1:25.000; and magnetometric and gravimetric maps were employed. Besides the interpretation of such data, field work was carried out.

The study areas belong to the following outstanding portions of some Brazilian pre-Cambrian structural provinces (Almeida et alii, 1981), as shown in Figure 1: Sudeste Fold Belt (Mantiqueira Province) which includes Tijucas sequence, Araçuaí Fold Belt (São Francisco Province), Brasília-Tocantins Collision Belt (Brasil Central Shield/Tocantins Province), Tijucas Belt Fold and Joenvile/ Pelotas Massifs.

These structural provinces consist of migmatite-granulitic complex, "greenstone belt" relicts of Archean age, metamorphic vulcano-sedimentary sequences from Archean to Lower Proterozoic ages, metapelites and metapsammites of Lower Proterozoic age, and basic and acidic magmatism. In all these provinces, policyclism, polimetamorphism, tecto-orogenesis, and thermotectonic events were recognized since the Archeozoic age.

2.0 METHODOLOGICAL ASPECTS

The main methodological procedures were, orbital images and pancromatic aerial, photographs visual interpretation based on Veneziani and Anjos (1982), as well as the geometric and statistical analysis of fracturing (Plicka, 1974; Alieyev, 1982; Anjos,1986 and others).

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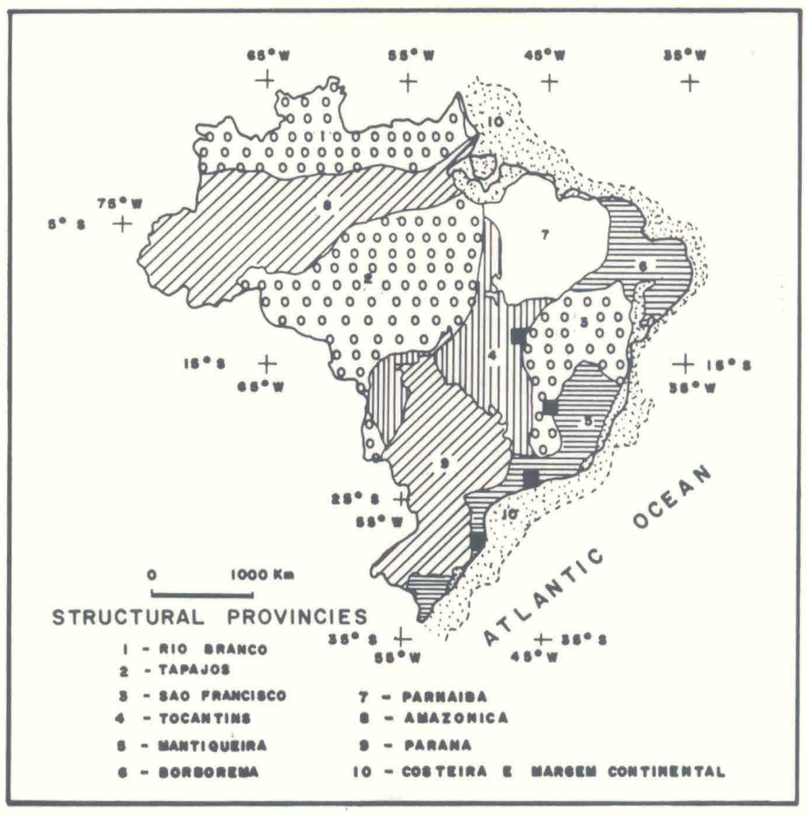

Figure 1 - Map showing Structural Provinces and the research areas. (Modified from Hasui and Almeida, 1984).

The interpretation method employes the analysis of relief and drainage textural features which can show similar physico-chemical properties for homogeneous lithologic units, regarding their permeability, solubility, deformation and coesion-erosion. This method leads to the recognition of joints, faults, bedding and foliation structures and to the inference of their strikes and dips.

Fracturing analysis was based on the identification of joint zones, which consist of 10 to 30 cm spaced parallel joints, diping from 90 to 70 degrees. These joint zones can extend over distances as long as tens or hundreds of kilometers to form sets of joint zone.

Several researchers, as Veneziani (1987) and others, consider that joint zones have their origins related to the reactivation of narrow tectonic lines, which can be correlated with ancient lines of crustal weakness. These lines of weakness are the main responsible factor for the paleogeographic, sedimentary and tectono-structural control.