

On the use of Landsat imagery for the litho-structural mapping of the Pernambuco State semiarid region, northeastern Brazil

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ABSTRACT: The study focused the evaluation of different digital image processing techniques for litho-structural interpretation on part of the Landsat 7 (ETM+) scene (path/row 216/66), located in the semiarid of the states of Pernambuco, Bahia and Alagoas, NE of Brazil. Well-established geological remote sensing techniques, such as arithmetic band operations, principal components transform, decorrelation stretching and morphostructural analysis were tested. The results showed to be complementary. Among the digital processing techniques used in this work, band ratio R(5/7)G(5/1)B(3/5) color composite allowed the discrimination of a larger amount of geological targets, mostly located to the north of the Pernambuco Lineament. In this region, data indicated dominance of ductile tectonics: a framework composed of reworked small ancient geological fragments, surrounded by younger metamorphic lithotypes, oriented NE. The Pernambuco Lineament is characterized by a strip of outstanding linear discontinuities trending- E-W, which, eastwards, shows a fan-shaped ramification pattern. To the south of the Pernambuco Lineament, data suggests lower geological variability, and the dominance of brittle tectonics.

KEY-WORDS: LITHO-STRUCTURAL MAPPING, SEMIARID NORTHEASTERN BRAZIL, GEOLOGICAL REMOTE SENSING.