

FRACTAL GEOMETRY AS AN AID FOR MINERAL POTENTIAL ANALYSIS

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The mineralizations referred to the ADPC (Alkaline District of Poços de Caldas) are associated with processes of fracturing and hydrothermal alteration. The ADPC points out as a positive feature through rocks from embasament (granites and gneiss) from western region of Bloco do Pinhal in Brazil. It has a diameter around 30km and its extension is 800km². It's evident lineaments oriented N45E and N45W in the area, such as occur in Bloco do Pinhal. An important task which Fractal Theory leads is the development of systems for natural complex forms. The lineaments show a fractal system. The lineaments were observed from two images (Landsat-TM5 and RADAR) because the attenuation caused by the image acquisition. The fractal dimension was calculated through the Box-Counting Method. A Fractal Dimension Map was created as a continuous surface. The coincidence of greater fractal dimension areas with anomalous radiometric regions was observed using a GIS. A greater fractal dimension points out to areas where we have a greater number of fractures and a greater number of fractures intersection. The coincidence of those anomalous radiometric regions and those of greater fractal dimension can, in this manner, reveal target areas for a more detailed research for radioactive minerals. A Map of Classes for Mineral Potential (U and Th) was created with basis on this observation. The coincidence of mining points (U and Th) with high and medium classes from The Map of Classes for Mineral Potential (U and Th) was tested and observed those mining points inside these classes.