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Fractal characterization of natural radioactivity measurements in the Hoggar region (Algeria)

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The measurements of the Gamma Ray contribute to the establishment of the basement's lithospherical model. However, the exploitation of raw data acquired in the field can not be performed before their pre-processing (corrections of the Compton effect, altimetry and the instrumental noise, and interpolations). These operations may have an effect on the stochastic component of the data, which contains information on the local heterogeneities of the medium.

In this study, we present a fractal analysis of airborne spectrometric measurements of Gamma Ray recorded in the Hoggar area. First, we show the fractal behaviour of these data. Then, we mention that the functions of the local fractal parameter (Hurst parameter) obtained from the raw and the pre-processed data present very close values. The fractal properties of the raw data are then not influenced by the pre-processing operations. This result allows us to directly carry out a fractal analysis of the raw Gamma Ray measurements without pre-processing them, and their stochastic component is indubitably kept intact.

Keywords: Hoggar, airborne spectrometric data, fractal,Hurst exponent.