Heterogeneities Analysis Using the Generalized Fractal Dimension and Continuous Wavelet Transform

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The main goal of this work is analyze heterogeneities from well-logs data using the wavelet transform modulus maxima lines (WTMM). Firstly, the continuous wavelet transform (CWT) with sliding window is calculated. The next step consists to calculate the maxima of the modulus of the CWT and estimate the spectrum of exponents. The three generalized fractal dimensions D0, D1 and D2 are then estimated. Application of the proposed idea at the synthetic and real well-logs data of a borehole located in the Algerian Sahara shows that the fractal dimensions are very sensitive to lithological variations. The generalized fractal dimensions are a very robust tool than can be used for petroleum reservoir characterization. Keywrods: reservoir, Heterogeneities, WTMM, fractal dimension.