

Several studies have shown the possibilities offered by multifractal analysis in image processing, particularly for classification of heterogeneous texture with a great complexity in the structure. Indeed, in most cases, the mode of multifractal spectrum is used for classification; in this work we propose two different methods to estimate this spectrum. This paper focuses on the classification of Brodatz textures using multifractal analysis. Two methods are considered. The first method is based on the multifractal formalism of Frish and Parisi through the Legendre transform, the second one is a direct method based on the box-counting algorithm. For both approaches, we used the multiresolution coefficients of the wavelet transform, with the Gaussian first order derivative to find singularity exponents in the direct method, and the leaders coefficients in the case of the multifractal formalism. The Legendre transform was used to estimate the multifractal spectrum, while the box-counting method was used to compute the Hausdorff dimension of sets of the same degree of singularity. Results demonstrate that it is more interesting in some cases to use the box-counting method than the Legendre transform to obtain a more accurate spectrum, as in the case of bimodal spectrum