



3D macropore geometry of structured soil columns with X-ray CT characterized by the singularity spectrum

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One way to study the complexity of disordered media is to consider a measure related to some aspect of it and to characterise this measure by means of a suitable mathematical technique. Soils are examples of disordered media and may be idealised as consisting of the solid and void components. In this case the measure that renders the pore-space volume enclosed in a domain centred at a point, often exhibits large variations from point to point. This complex behaviour may be characterised by the multifractal spectrum of singularities as long as suitable scaling are found; in such case, the properties of the distribution are related to the spectrum. Multifractal analysis has been successfully applied in the characterisation of soil porosity with digital 2D images acquired with a variety of methods. New technologies as X-ray computed tomography render 3D images of the pore space geometry of intact soil samples. In this work we will study the appropriateness of multifractal analysis to assess the complexity of soil macropore 3D geometry and its complexity will be characterised with entropy-based multifractal parameters.