



Quantifying a preferential flow path in a clay soil: multifractal and wavelet approach

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Spatial variability of preferential pathways for water and chemical transport in field soils shows complex variations at different scales that cannot be accurately described with stationary assumptions. Scale-based mathematical tools as Multifractal Formalism or the Wavelet Transform Analysis (WTA) reveal a powerful potential in soil analysis, as WTA is able to represent data variability at different scales and it can be studied under statistical measurements. In this way, this information may complement previous parameters in order to quantify the morphology of preferential flow paths. Two different WTA are applied. The comparison of the results between methodologies respect to moments methodology of multifractal analysis are discussed in the context of multiscaling structure of preferential path-flow underfield conditions. The method is illustrated with images of horizontal planes of the subsoil, acquired after dye infiltration.