



Spatial dispersion and clustering of soil structure through lacunarity of X-ray CT images of soil macropore volumes

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Lacunarity can be seen as a scale dependent measure of heterogeneity or texture [U+2015] in terms of image analysis [U+2015] that was first introduced to quantify different patterns of dispersion and clustering that display geometrical objects with the same fractal dimension. Notwithstanding, lacunarity functions have been revealed as means to measure the deviation of object's geometrical structure from translational invariance beyond self-similarity and fractal geometry. In this work, we will explore how lacunarity quantifies different patterns of dispersion and clustering of different geometrical structures of soil macropore volumes imaged by X-ray computed tomography. Samples extracted from columns were collected at the experimental farm "Finca La Grajera" in La Rioja (Spain), property of La Rioja Regional Government (northern Spain). The vineyard selected was established in 1996. During the 1996 to 2004 period, the soil management was conventional tillage. Before the vineyard was established in 1996, a pasture–legume–cereal rotation was used. In 2004 an experiment was established with different types of soil cover management in between. On December 2010 columns were extracted vertically by percussion drilling between rows of the vineyard.