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Design of synthetic soil images using the Truncated Multifractal method

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The use of synthetic images in soils is an increasingly used resource when comparing different segmentation methods. This type of images can simulate features of the real soil images. We can find examples of 2D and 3D synthetic soil images in the studies by Zhang (2001), Schlüter et al. (2010) and Wang et al. (2011).

The aim of this presentation is to show an improved version of the Truncated Multifractal method (TMM) which was initially introduced by Martín-Sotoca et al. (2016a, 2016b). The TMM is able to construct a 3D synthetic soil image that is composed of a known air-filled pore space and a background space, which includes, as a novelty, a pebble space. The pebble space simulates the pebbles or granules of high intensity that typically appear in computed tomography (CT) soil images. The TMM can simulate the two main characteristics of the CT soil images: the scaling nature of the pore space and the low contrast at the solid/pore interface with non-bimodal greyscale value histograms.

In this presentation we introduce some new components which improve the similitude between real and synthetic CT soil images.

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