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# Pore detection in Computed Tomography (CT) soil 3D images using singularity map analysis

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X-ray Computed Tomography (CT) images have significantly helped the study of the internal soil structure. This technique has two main advantages: 1) it is a non-invasive technique, i.e. it doesn′t modify the internal soil structure, and 2) it provides a good resolution. The major disadvantage is that these images are sometimes low-contrast in the solid/pore interface.

One of the main problems in analyzing soil structure through CT images is to segment them in solid/pore space. To do so, we have different segmentation techniques at our disposal that are mainly based on thresholding methods in which global or local thresholds are calculated to separate pore space from solid space. The aim of this presentation is to develop the fractal approach to soil structure using “singularity maps” and the “Concentration-Area (CA) method”. We will establish an analogy between mineralization processes in ore deposits and morphogenesis processes in soils. Resulting from this analogy a new 3D segmentation method is proposed, the “3D Singularity-CA” method. A comparison with traditional 3D segmentation methods will be performed to show the main differences among them.