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Comparison of NMR relaxation times and morphological pore size distribution

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Longitudinal NMR relaxation (T1) in porous media is dependent on the diffusion path length of water molecules until they contact the solid soil matrix, and thus it is a function of the pore size distribution.

For a soil sample we have measured both the spectrum of the T1 relaxation times with NMR at different water contents and the soil structure with Xray CT. Based on the Xray CT we determined the distance maps to the solid phase for the ẅater filled pore spaceät different water potentials. In order to determine the water filled pore space we have used morphological opening with given sphere sizes. The
resulting distance spectrum for the different opening steps is then compared to the NMR spectra for different water potentials.