



An Approach to Estimate Hysteresis Using Similarity

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INTRODUCTION

Accurate description of soil hydraulic properties are essential to understand soil-water behavior. Within the framework of soil-water relationship hysteresis of the soil-water characteristics is a crucial problem related to model soil water movement. Several attempts have been published to estimate hysteretic effects and some theories and proposed solutions are now available.

METHODS

Using similarity SCOTT et al. (1983) revised by KOOL and PARKER (1987) suggested a simple hysteretic model. Following their method, numerical scaling of the soil water characteristics is simple done but shows frequently no satisfactory results especially for the drying scanning curves. KASTANEK (1992) suggested a model taking into account geometrically considerations. A recently published method to approximate the soil-water characteristics with cubic-spline interpolation (KASTANEK and NIELSEN, 2001) facilitates the proposed method of inspection of the functional trend of the hysteretic moisture retention relationship.

RESULTS

Although no satisfactory results for all shown examples may be achieved the accuracy to estimate hysteresis can be increased with the proposed improved method but it needs the computing facilities of a computer. For this reason the proposed model as well as some other existing models (MUALEM, 1984; SCOTT et al., 1983) are included in the existing interactive computer program using spline interpolation to describe the soil water characteristics (KASTANEK and NIELSEN, 2001).

REFERENCES

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