Review of article "Subgrid spatial variability of soil hydraulic functions for hydrological modeling" submitted by Phillip Kreye and Günter Meon (University of Braunschweig, Institute of Technology, Leichtweiss-Institute for Hydraulic Engineering and Water Resources, Dept. of Hydrology, Water Resources Management and Water Protection, , Beethovenstr. 51a, D-38106 Braunschweig, Germany), Email: (P.Kreye@tu-bs.de) to Hydrology and. Earth System Sciences

The article addresses an important question of effective parameterization of hydrological models by values of soil hydraulic property of empirical models. This study was focused on the analyzing of correlation between texture classes for German soil classification from one side and hydraulic soil property values of saturated soil hydraulic conductivities estimated for Mualem model (Mualem, 1976) in the version of application for van Genuchten pf-curve model (van Genuchten, 1980) and from other side of parameters of soil water retention curves fitted by the same van Genuchten model.

Fulfillment of this task was conducted in the base of the software ROSETTA (Schaap et al., 2001) with derived by neural network relationships within UNSODA soil data base (Leij et al., 1996; Nemes et al., 2001) linking USDA soil texture classes with values of soil hydraulic parameters.

Scientific significance

The research on this article is based on a some statistical analyses of correlations between parameters linked with ROSETTA within the UNSODA soil database.

In our opinion scientific significance of this research is limited by the use of the same database for analyzing relationships between saturated soil hydraulic conductivity and parameters of soil water retention curves where fitted. This limitation may be overcome by the use of another soil database like HYPRES to approve obtained results and may could provide a way for large verification of derived clusterization for any soil classes.

Scientific Quality

In our opinion a scientific quality is also limited by the use of parameters of specific empirical models describing shapes of both unsaturated soil hydraulic properties that are "not always valid".

First of all it is quite important for modeling infiltration to use adequate models for fitting and should be discussed more deeply according to some textural classes of soil and organic matter content. Thus is really important in many rainfall events for upper soil horizons with macropore structure controlling infiltration into soil profile which is not taken into account by selected Mualem-van Genuchten models.

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