



## Soil hydrology of paddy soils in SE China

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Terraced paddy soil landscapes are characterized by a complex hydrological system that needs to be analysed in detail in order to assess and predict water and solute fluxes at field scale. The objective of this study is the quantification of selected soil hydraulic properties and resulting ground- and surface water quality of paddy rice fields in China with respect to soil structure and land use. The poster presents the general concept of the research project and preliminary results.

The research area is situated within subtropical China, the soils developed from quaternary clays.

First investigations concentrated on the lateral and vertical infiltration rate of the top soil layer and the underlying plough pan, respectively. Vertical infiltration was tested using the classical double ring infiltrometers. Lateral flux properties were investigated over a flow length of 50 cm. The lateral discharge resulting from the imposed gradient was captured spatially resolved by 24 metal sheets (15 cm width).

The infiltration measurements on the plough pan revealed a strong dependence between the infiltration rate and the time period the site has been utilized as a paddy rice field. On three investigated fields with ages of 5, 20 and several hundred years, the vertical infiltration rate was approximately 10 mm/h, 0.3 mm/h and 0.06 mm/h, respectively. The high variance of the values within each field documents the heterogeneity of the plough pan.

The top soil layer exhibited lateral preferential flow. The measured fluxes varied between 0 and 400 mm/h at one experimental plot (5 years in use) and between 0.4 and 10 mm/h at a second site (several hundred years in use), showing significant flow disequilibrium. A heterogeneity index was calculated to quantify the magnitude of flux heterogeneity. The results revealed that the significance of preferential flow depends

on crack structure and water content, the imposed gradient and the experiment duration.