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## **The spatial variability of scale-dependent correlations between soil properties and relief information in a typical paddy soil landscape of south-east China**

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The understanding of soil pedogenetic processes requires reliable knowledge about the interaction between soil property distribution, and the different factors of soil formation. This is also true for stratified soils that have been developed under strong human influence and long term land use such as paddy soils. Until today the soil forming processes in paddy soil landscapes are rarely studied. Knowledge about the spatial arrangement of the spatial pattern of soil properties and soil forming processes underlying the spatial structure of soil distribution are missing widely. Thus a multi-scale investigation of quantifying spatial soil variation and analysis of spatial correlation among soil properties and morphometric attributes was conducted. In our studies we analyzed the spatial dependencies of soil property distribution such as texture, horizon depth, organic C content on the one hand and morphometric attributes and terrain indices on the other; In order to predict soil property distribution by combining measured field data and terrain variables as co-variables, we tested the performance of different prediction models. Above this different models of coregionalization were fitted with nugget effect and different spatial structures with various ranges to the experimental direct and cross-variograms of the topsoil and plough pan properties. A principal component analysis was applied to identify the scale dependent spatial correlations on each scale. Beyond this the relative importance of uncertainty measures for sills and structural coefficients of spatial correlation and determination has been assessed. Our results show that the spatial correlation of soil properties and the uncertainty pa-

rameters are scale dependent. We assume that the different and varying management factors are directly the cause of the soil spatial variability. The factorial kriging application that combines pedological knowledge with geostatistical techniques was useful to confirm these assumptions.