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# Predicting flood peaks in an austrian mesoscale catchment with different types of hydrological models

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The objective of this paper is to present the comparison of model performances simulating flood peaks obtained with a conceptual and a physically based model in an Austrian mesoscale catchment. The conceptual and physically based parameters of the models were obtained using the same point and spatial information, respectively. Applying the semi-distributed models, the experimental catchment was subdivided into homogenous units that are identified by intersections of subcatchments, land cover information and elevation bands. Runoff at the outlet is calculated by summing up the area-weighted routed runoff of the units. One model, COSERO, simulates soil processes with physically based and conceptual parameters. The physically based parameters of the soil module were obtained using point and spatial information. Point measurements of soil thickness and a digital elevation model were used to establish a relationship between soil thickness, ground level elevation and slope of the terrain for arable land and forest, respectively. Additionally, spatial information of soil type was used to estimate field capacity and permanent wilting point. Two gauged subcatchments were used to estimate the conceptual parameters for slow percolation and infiltration excess overland flow. For the second model, the conceptual soil module of COSERO was replaced by a soil module without conceptual parameters. The relation of infiltrated water to surface runoff during a rainfall event is calculated with a Green & Ampt model approach. The percolation rate in deeper regions is depended on the unsaturated hydraulic conductivity, which is obtained with the van Genuchten-Mualem equations. Runoff was simulated continuously over 12 years with daily time-steps during periods of low flow and hourly time-steps during flood events with each of the model types for calibration and validation. Preliminary results indicate, that the incorporation of physically based parameters leads to a slight increase of the model

performance for flood events, expressed by the Nash-Sutcliffe efficiency, given the spatial resolution of soil information in the catchment. It is concluded, that the application of physically based modelling of soil processes in catchments with comparable data base is more appropriate.