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Soil erosion and surface runoff model SMODERP

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This contribution presents a software tool for calculation and prediction of soil erosion and surface runoff from agricultural lands. There is no universal tool to properly describe the origin and the processes related to the surface runoff and sediment transport in different scales. For a design of any technical erosion control measures, that are used to interrupt the surface runoff, it is necessary to identify basic outflow characteristics (discharge, flow volume). Numerical model SMODERP was developed for determination of these characteristics. The model is being developed at the Department of Irrigation, Drainage and Landscape Engineering , Civil Engineering Faculty, CTU in Prague. SMODERP is physically based one-dimensional episodic model that includes the processes of infiltration, surface retention, surface roughness and vegetation impact on runoff.
The model has been substantially upgraded and tested in last few years. Especially runoff parameters, time and spatial discretisation were recalibrated and validated. Runoff parameters were recalibrated on the set of forty measurements performed on the laboratory rainfall simulator on five soil types. The parameters were designed for five soil types categories according to content of particles with size up to 0.01 mm (Novak soil classification). The precipitation episodes can be chosen from the attached catalogue or can be designed by a user. We also present how the input data can be obtained based on available resources (soil maps and data, land use, terrain models, field research, etc.) and how can be used in the assessment erosion risk and in designing of erosion control measures.
The model is meant to be used not only for the research purposes, but mainly for the engineering practice. We present the new version of the model that includes a new user friendly graphical interface.
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