



Micro relief parameters from high resolution DEMs as representative values for physical based soil erosion models

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Field parameters, such as hydraulic roughness are indispensable for modeling soil erosion on a physical base. Established approaches to acquire parameters for hydraulic roughness are based on flow velocity, flow volume and the slope angle. Other methods refer to grain sizes affecting a volume flow as an indicator for roughness.

This work presents a remote sensing approach to generate high resolution surface reconstructions of rough terrain in different scales. As the ability of producing high resolution digital elevation models (DEM) is rapidly increasing over the last years, the possibilities of morphometric analysis of micro reliefs are also constantly developing. Point spacings of very dense point clouds acquired with the help of terrestrial laserscanning or structure from motion are minimal. Thus, even small grain sizes and inhomogeneity can be identified in the DEMs.

Surface models used for this study were acquired in advance and afterwards simulated flow and rainfall events. Resulting changes in surface roughness caused by fluvial erosion could be detected on bare soil and sparsely vegetated areas. To validate the measured roughness values flow velocities and flow volumes were regularly recorded during the events.

This work aims to present a step forward to standardizing new methods in data acquisition in soil erosion modeling.