Assimilation of SAR data for mapping of dominant runoff formation processes on agricultural land

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Within the last decades some approaches in assessing landscape functions in the frame of precautionary flood protection and sustainable catchment management do not focus only on physical soil properties but increasingly on the assignation of dominant runoff processes. This is owned to the fact that sensitiveness against precipitation may be coupled with a bunch of geographical factors like soil patterns, geology or aspect and slope, which are often not determined easily.

Employing high resolution SAR-systems it is feasible to identify the spatial pattern of shallow soil moisture amplitude even for smaller landscape segments. To distinguish the moisture signal from disturbance variables it is recommended to transformed the used multitemporal and co-registrated datasets using principal components analysis. An additional stratification of the test region was done by integration of land use information derived from optical satellite data. On behalf on an arable land within the Bitburger Gutland, modelled process maps are compared with classification results for the dynamic of shallow soil moisture derived from multitemporal and multisensoral SAR data. The latter are expected to reflect real soil conditions not blurred by uncertainties or mistakes in spatial soil data. First results for comparison and validation of these methods show the potentials of the combinations of both approaches especial for regions with incomplete field data.