Potentialities of the multiobjective approach to assimilate remote sensing data in SVAT models

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POTENTIALITIES OF THE MULTIOBJECTIVE APPROACH TO ASSIMILATE REMOTE SENSING OBSERVATIONS IN SVAT MODELS

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The purpose of this paper concerns remote sensing data assimilation in physically based model by the way of a multiobjective calibration procedure. Generally, the calibration of Soil Vegetation Atmosphere Transfer (SVAT) models consists to determine the best parameter set in terms of model performances. Due to model structural uncertainty and to errors on the observations, a such determination of a unique parameter set is generally impossible. This problem of non-uniqueness of the solution can be investigated by a multiobjective approach, in which different objective functions are optimized simultaneously.
In this context we developed a multiobjective approach allowing to combine sensitivity analyses and an iterative optimisation procedure of the model parameters in terms of uncertainty ranges. This paper investigated the potentialities of a such calibration approach in a remote sensing context, in order to drive SVAT models only by the way of remote sensing observations. The consequences of the calibration procedure on the simulated surface processes were analysed for different studied cases. Main results showed that physically based SVAT models can be constrained by remote sensing observations without initial a priori information about soil and vegetation properties.

Potentialities of the multiobjective approach for remote Sensing data assimilation in SVAT models.