



Validation of a new soil hydrology for layered soils in the SVAT model TERRA-ML

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Recently, new soil data maps were developed, which include vertical soil properties like soil type. When implementing those into a multilayer Soil-Vegetation-Atmosphere-Transfer (SVAT) scheme, discontinuities in the water content occur at the interface between two dissimilar soils. Therefore, care must be taken by solving the soil moisture based Richards equation (RE) for calculation of vertical soil water fluxes.

For all simulations, we used the “stand-alone” code of the SVAT model TERRA-ML (implemented in COSMO/CLM, <http://cosmo-model.org>). We displaced the operationally used soil water based RE by a mixed (soil water and soil matric potential based) form and modified it by subtracting the equilibrium state of soil matric potential from the hydraulic potential. Soil moisture and soil temperature were simulated using hourly observed station data as meteorological forcing from the “Coordinated Energy and Water Cycle Observation Project” (CEOP, <http://data.eol.ucar.edu/codiac/projs?CEOP>) for the stations Lindenberg (Germany) and Cabauw (Netherlands). Model results are closer to observations using the new soil hydrology in layered soils.