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Evapotranspiration Monitoring Using Remote Sensing Measurements Assimilated in a SVAT Model

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The ISBA (Interactions between Soil, Biosphere, and Atmosphere) model is a soil-vegetation-atmosphere transfer (SVAT) scheme able to simulate the energy and water budget with soil and surface characteristics and climate forcing (Noilhan and Mahfouf, 1996). We used this SVAT model on a 5 ?5 km2 agricultural region in the South-East of France (Alpilles/ReSeDA) with the aim of monitoring surface energy and mass exchange at high spatial resolution (20 m) and low spatial resolution (1 km). The land use map was estimated at high resolution by classification of SPOT remote sensing data. Spatial and temporal evolution of surface characteristics like Leaf Area Index (LAI), fraction of vegetation cover or albedo used as forcing input in the model are derived from airborne PolDER measurements (Weiss et al., 2002). Soil physical characteristics are calculated by model relations using the soil texture extract from the regional soil map reference. Problem is that regional soil texture map is spatially very poor. In order to validate SVAT simulation results, the surface energy fluxes and soil water content evolution simulated by the model are compared to ground measurements in specific fields when it is possible (Olioso et al., 2002) and to estimation of spatial evaporation from airborne remote sensing Infra-Red surface temperature(Jacob et al., 2002). In a first step, this comparison showed that the standard parameterization of ISBA led to a large underestimation of evapotranspiration. In a second step, the assimilation in the SVAT model of the remote sensing data at airborne acquisition dates

made it possible to correct spatial soil water content characteristics.

Keyword : SVAT, assimilation, soil water content

Jacob, F., Olioso, A., Gu, X.F., Su, Z. and Seguin, B., 2002. Mapping surface fluxes using airborne visible, near infrared, thermal infrared remote sensing data and a spatialized surface energy balance model. Agronomie: Agriculture and Environment, 22: 669-680.

Noilhan, J. and Mahfouf, J.F., 1996. The ISBA land surface parameterization scheme. Global Planetary Change, 13: 145-159.

Olioso, A. et al., 2002. Monitoring energy and mass transfer during the Alpilles-ReSeDA experiment. Agronomie, 22: 597-610.

Weiss, M. et al., 2002. Validation of neural net techniques to estimate canopy biophysical variables from remote sensing data. Agronomie, 22: 547-553.