Comparison of SVAT models over the Alpilles ReSeDa experiment. I Description of the framework and the data

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EGS XXIIIth General Assembly, 25-28 april 2000, Nice, France, 2000

The Alpilles-ReSeDA program has been initiated to develop and test methods for interpreting remote sensing data that could lead to a better evaluation of soil and vegetation functioning (biomass production, crop yield, energy balance and water budget). The proposed approach is based on the assimilation of remote sensing data into soil and vegetation functioning models (Olioso et al. 1998 and Pré vot et al. 1998). Among these models, Soil Vegetation Atmosphere Transfer models (SVAT models) have been developed to describe our current understanding of the physical and biophysical processes that occur between the atmosphere, vegetation and soil. They describe the physical processes that control energy and mass transfers in the soil/vegetation/atmosphere continuum (radiative, turbulent and water transfers) and provide estimates of the time course of soil and vegetation state variables with a fine time step compatible with the dynamics of atmospheric processes. They have been mainly used for energy balance and water balance assessments in meteorological, climatological and hydrological studies. They may also be used to estimate the surface temperature that can be measured in the thermal infrared domain, and for some of them, the surface soil moisture that might be measured in the microwave domain. They have been proposed for monitoring energy balance or soil moisture by using remote sensing data by means of assimilation procedures (Soer 1980 , Taconet et al. 1986 , Camillo 1991, Ottlé and Vidal-Madjar 1994 , Olioso et al. 1999a , Calvet et al. 1998 , Burke et al. 1998 or Wigneron et al. 1999 . Some authors also proposed to force vegetation characteristics estimated from reflectances measurements into SVAT models (Noilhan et al. 1991, Ottlé and Vidal-Madjar 1994, Sellers et al. 1996).

In the frame of the Alpilles-ReSeDA program, a large experiment was set up in order to characterize transfer of energy and water between the soil, the vegetation and the atmosphere at the scale of a small agricultural region over one year. This experiment included a large range of remote sensing measurements from satellite or airborne sensors, as well as a large number of ground measurements of meteorological, soil and vegetation variables. The set up of the experiment was based on the following concept: ground measurements were done on some specific fields in order to calibrate and test assimilation of remote sensing data procedure, and remote sensing measurements were done over the whole experimental area in order to extrapolate the procedure to this area. In this paper, we present the measurements performed at the ground level and give an overview of the soil, crop and climatic conditions that we encountered during the experiment.

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