Geophysical Research Abstracts, Vol. 8, 00616, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00616

Estimation of energy-balance components for a photochemical reaction-transport model

Dalma Szinyei (1), Róbert Mészáros (1), István Lagzi (2)

(1) Department of Meteorology, Eötvös Loránd University, Hungary, (2) Institute of Chemistry, Eötvös Loránd University, Hungary (desde@freemail.hu)

Latent and sensible heat fluxes realize the energy exchange between surface and the atmosphere. Sensible heat flux determines the temperature of the air and latent heat flux describes processes of evaporation and condensation. Intensity of these fluxes is an essential factor in air-land interactions. The goal of this study is to investigate an energy balance sub-model for the coupled TRansport-EXchange (the so-called TREX) model. Heat fluxes over three different vegetation types were calculated with both the Penman-Monteith and the Priestley-Taylor methods. Estimated values have been compared with measured data. Eddy covariance measurements have been carried out over a pine forest, a semi-natural grassland and a mixed grassland-agricultural area. Spatial and temporal variability of latent and sensible heat fluxes, and also the advantages and disadvantages of two different parameterizations are analysed in this study. Using the measured latent and sensible heat fluxes, some very uncertain model-parameters (modified Priestley-Taylor parameter, minimum stomatal resistance, soil heat flux) have been calculated for the three vegetation types and their spatial variability are also described. After the model calibration, calculations were applied over Hungary using these test results. Energy budget components were estimated on a regular grid with a resolution of 0.10 x 0.15 degree for 1998 July. The meteorological data utilised in the model were generated by the ALADIN meso-scale limited area numerical weather prediction model used by the Hungarian Meteorological Service.