

Inverse estimation of turbulent fluxes and surface layer parameters from weather station data and surface temperature

P. Martano

CNR ISAC, Lecce, Italy (p.martano@isac.cnr.it)

A diagnostic expression for the available energy flux (sum of latent and sensible heat fluxes) as function of the horizontal wind speed, air temperature and humidity and surface brightness temperature, is used to evaluate the turbulent surface fluxes of heat and momentum. Thus, an inverse method is applied to compute the unknown parameters in the mentioned expression (roughness lengths and soil surface resistance), based on the Marquardt-Levenberg approach for the minimum chi-square of the available energy and the horizontal wind speed.

The turbulent fluxes are then obtained applying the flux profile relations and the energy budget. This self-consistent procedure, that allows the evaluation of the turbulent fluxes from weather station data without the need of otherwise estimated local parameters, is tested over field data.