



Accounting for minor storage terms in an attempt to close the measured surface energy balance over a winter wheat field in Southwest Germany

Ravshan Eshonkulov, Arne Poyda, Joachim Ingwersen, and Thilo Streck

Institute of Soil Science and Land Evaluation, Hohenheim University, Stuttgart, Germany
(ravshan.eshonkulov@uni-hohenheim.de)

Studies of energy and water exchange between the land surface and the atmospheric boundary layer are important to understand weather dynamics and climate change. Energy and water fluxes were measured on a winter wheat field in Kraichgau, Southern Germany, using the eddy covariance (EC) method. It is well known that EC measurements suffer from incomplete closure of the energy budget. In addition to the common ground heat flux measurements we measured heat storage in soil and the wheat canopy using high-precision temperature loggers within the EC footprint. Ground heat flux was re-calculated by calorimetric and harmonic analysis. First results obtained by the two methods will be compared. Based on measured data we calculated the contribution of photosynthesis, the air heat storage inside the canopy as well as the atmospheric moisture change to the energy budget. Our results show that accounting for minor storage terms improves the closure of the energy budget, but only to a limited extent. Further investigations will be necessary to identify additional sources of the energy gap typical for EC measurements.