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Study of the energy budget during AGRISAR 2006

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The objective of this study is to perform a thorough intercomparison of a number of methods to measure latent and sensible heat fluxes. The scintillometry and Bowen ratio methods have been selected for this purpose. The data for the experiment are acquired as part of the AGRISAR 2006 project. During the growing season of 2006, a Bowen ratio station has continuously been operational in a winter wheat field. Consistently high latent heat fluxes have been obtained, even during very warm and dry periods. These findings are confirmed by scintillometer measurements taken during the last week of the study period. This leads to the conclusion that the evapotranspiration rates are not determined by the surface soil moisture content. This conclusion is supported by Time Domain Reflectometry data aquired during the same period. At deeper soil layers, the moisture content was consistently relatively high. This indicates a disconnection between the surface and deeper soil moisture content, and the dependence of the evapotranspiration rates on the deeper soil moisture content. Application of two hydrologic models (PROMET and TOPLATS) to the test site supports these findings. Preliminary conclusions of this study are thus that the estimates of the evapotranspiration rates of both methods are consistent, and that in order to model these values information of the moisture content of the deeper soil layers is necessary.