Geophysical Research Abstracts, Vol. 7, 01670, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01670

Impact of local and effective roughness on heat flux computations in Midwestern croplands

C.B. Hasager (1), W.P. Kustas (2), F. Li (2) and N.O. Jensen (1)

(1) Risoe National Laboratory, Wind Energy Dept., Roskilde, Denmark, (2) USDA-ARS Hydrology Laboratory, Beltsville, Maryland, USA (charlotte.hasager@risoe.dk)

A numerical wind flow model for estimating local and effective momentum roughness and shear velocity was applied to remotely sensed land cover, leaf area, and surface temperature at 30 m resolution in central Iowa. Nearly 90% of the land cover in this region is evenly split between corn and soybean with remaining being grasses/other crops, urban/road and forested areas. During the rapid crop development from mid-June to mid-July the effective and local roughnesses increase. The model outputs of local and effective roughness and shear velocity were compared to tower and aircraft measurements. In addition, sensible heat fluxes derived with the model using a single-source resistance formulation for the surface-air temperature difference was evaluated. A two-source (soil + vegetation) remote sensing-based surface energy balance model was also applied at its operational resolution of 5 km to evaluate the impact on heat flux calculations using a land cover-based estimate of effective roughness versus the value derived from the numerical wind flow model. Results from a mixed pixel comprised of nearly 15% forest, 75% corn and soybean and the remaining 10% grass, urban/roads will be discussed.