

Remote sensing images used for aggregation of the scalar roughness, z_{0t} .

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ABSTRACT

A new concept for aggregation (area-averaging) of the roughness lengths for the momentum and sensible heat flux is described in which the ratio between momentum roughness, z_0 , and temperature roughness, z_{0t} , is calculated explicitly instead of estimated as a constant ratio. Aggregation model results from a case study in the Alpilles area in France are presented. The model inputs are maps of surface temperature (airborne TIR scanner), leaf area index (airborne POLDER) and land cover type (SPOT). The local roughness length for momentum is assigned per pixel based on land cover type and vegetation height measured during the growing season. For bare soil, water and urban area there is a constant ratio between the local values of z_0 and z_{0t} . In vegetated areas the ratio is dependent upon vegetation type and leaf area index. Therefore $\langle z_0 \rangle$ and $\langle z_{0t} \rangle$ are no longer proportional. The model results on sensible heat flux are compared to in-situ eddy correlation observations from 7 agricultural fields through a growing period. A total of 16 different days are investigated. The rmse error on sensible heat is around 70 W m^{-2} . Slightly better results are obtained when using in-situ radiosounding data as input instead of Meteo France Arpège grid results to the aggregation model. It is the air temperature, wind speed and wind direction at the computational level that is used in the model runs.

For further details:

Hasager, C.B., Jensen, N.O. and Olioso, A., 2002 Land use, surface temperature and leaf area index maps from remote sensing data used for the aggregation of momentum and temperature roughnesses. *Proceedings of the 1st International Symposium on Recent Advances in Quantitative Remote Sensing*, 16-20 September 2002, Valencia, Spain. (8 pages accepted)

Olioso, A., Hasager, C., Jacob, F., Wassenaar, T., Chehbouni, A., Marloie, O. 2002 Mapping surface energy fluxes from thermal infrared and reflectances data using various models over the Alpilles test site. *Proceedings of the 1st International Symposium on Recent Advances in Quantitative Remote Sensing*, 16-20 September 2002, Valencia, Spain. (8 pages accepted)