Biogeosciences
Discussions

Open Access

Interactive comment on "Remotely sensed land-surface energy fluxes at sub-field scale in heterogeneous agricultural landscape and coniferous plantation" *by* R. Guzinski et al.

Anonymous Referee #2

Received and published: 11 April 2014

This paper combines simultaneous MODIS and Landsat data to obtain surface fluxes at the Landsat thermal resolution. The air temperature at blending height used as input to the Two Source Energy Balance (TSEB) model at Landsat resolution is constrained at MODIS resolution by the Dual Time Difference (DTD) model. It is found that such a TSEB-DTD coupling scheme significantly improves the surface fluxes at fine (Landsat) resolution. In addition, the authors have implemented the DTD model in a "parallel" configuration, outperforming the previous "series" configuration.

It is a strong and well-written paper. The approach is clear and accurately described. I have only one comment, about the impact of the initial value of air temperature on the modeled fluxes :

Section 4.3.1 : air temperature seems to be one of the main factors affecting the accuracy/uncertainty in high-resolution modeled fluxes. Could the sensitivity of TSEB-DTD to initial air temperature be assessed ? Since the initial air temperature is modified in a two-step procedure (Section 3.3 page 5) 1/ by the physically based TSEB-DTD coupling scheme (step 5) and 2/ by an empirical smoothing filter (step 6), one may wonder how far the resulting air temperature is from the initial (step 3) and intermediate (step 5) value. When setting the initial value to ERA Interim (instead of tower measured) air temperature, would a lower difference between the resulting and initial value support the better accuracy in flux estimates ? What is the impact of the smoothing filter on the disaggregated fluxes?

Minor edits :

- L8, L842 : since the actual spatial resolution of Landsat thermal data is significantly larger than the resampling resolution, perhaps replace "30 m resolution" by "Landsat thermal resolution" or "flux tower footprint"

- L426 : up up-scale

- L820 : a unsystematic

Interactive comment on Biogeosciences Discuss., 11, 4857, 2014.