

Interactive comment on “Consistency between hydrological model, large aperture scintillometer and remote sensing based evapotranspiration estimates for a heterogeneous catchment” by B. Samain et al.

Anonymous Referee #1

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General comments. The topic addressed by this paper is quite interesting. The paper confirms the potential of LAS scintillometry for practical applications as well as the suitability of the ETlook and TOPLATS models for simulating the evapotranspiration and monitoring the water budget at the watershed scale. The cross comparisons between the three methods are clearly presented and the results honestly analyzed and discussed.

Specific comments. Section 3.2: The computation of the available energy requires
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G to be estimated at the surface, whereas measurements performed with soil heat flux sensors are made at a certain depth within the soil. Were corrections done for correcting these measurements for the heat storage above the plates? Section 4: More details should be given about the ETlook model. It is said its temporal resolution is 1 day. Does this mean that eq. (1) and (2) are computed only once a day and that daily averages of Rn and G fluxes, and of resistances are introduced in eq. (1) and (2)? If so how are they determined? How is the roughness length parameterized from the NDVI? a few indications or a reference (to SEBAL?) would help the reader. The same question rises for the soil resistance determined with the help of satellite microwave measurements. The computation of the soil moisture using the precipitation of the preceding 14 days needs more details and discussion. Section 5.1: The question of how to estimate the daily averages of flux measurements is not clear neither for EC nor LAS (see below). Why the threshold of 12 values out of 24? Why to keep such incomplete data? How are nighttime data taken onto account? p. 10878, l.19-21: what are the surroundings of the EC station in the footprint? Section 5.2: lines 10 to 20: similarly to EC case, why only half the data (12/24) are considered to be enough to average the LAS measurements over 24 h periods? Moreover, please detail the case of negative H values (that the LAS cannot measure by itself negative fluxes unless an assumption is made about atmospheric stability). Why setting H=0 for stable conditions? What has exactly been done for integrating the LAS values over the day (24 hours) should be summarized here and made clearer.

Technical comments. Section 2.2: At p. 10870 there is a repetition of exactly the same sentence about the equipment of net radiation and soil heat flux measurements at Liederkerke and Ternat. Simplify the second one. Is the depth of the soil heat sensor also 5 cm below the surface at Ternat? Section 2.3.2: How the 'no reliable hourly CN²' values and the failures of the algorithm for computing the LAS derived H flux' can be explained (7.6% of data loss)? Section 3: p. 10872, l. 26 typing error : please correct measurements Section 3.1: p. 10873, last paragraph: the information 9.5 km and 102.3 km² have already been given (p. 10872, l. 14-15). A few words to clearly state

that the footprint of the scintillometer measurements has been taken into account in the comparison process and with what method would be useful (with possibly a reference). Section 4: p. 10877, l. 14-22: the estimation of the roughness length has already been evocated p. 10876, l. 18-21. Please avoid repetitions and detail how the NDVI is used (see previous comment). Figures 4 and 5: the scales are much larger than the range of effective values, which partly masks the scattering of points. Is it possible to correct for this? Finally, last detail, I noted too many repetitions in the text of 'as'. Is it possible to suppress some of them?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 10863, 2011.

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