

Interactive comment on “Physical based retrieval of crop characteristics for improved water use estimates” by K. Richter and W. J. Timmermans

Anonymous Referee #1

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General comments:

The paper addresses the interesting scientific question whether physically based approaches to the retrieval of canopy properties important for the energy balance produce better results than an approach based on the NDVI, and this question is answered affirmatively. The concept of applying a look-up table for model inversion of PROSPECT-SAILH is not new, but it is interesting to see its application to the energy and water balance. The paper has a good structure and all references are consistent between the main text and the reference list.

Specific comments:

In Table 1 the ranges of the variables in the LUT database are given. I find the range

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in ALA rather small. Could you explain why such a narrow range was chosen? Also, it would be more informative if for each LUT variable the number of steps was given. Currently the paper gives only the total number of LUT entries (100000), but this is not sufficient information for the reader, as the result may also depend on other factors, like the regularity of the LUT, adaptations to sensitivities of the parameters, etc.

Page 1987, last paragraph: The discussion on the influence of soil moisture on NDVI is not very clear, since soil moisture may influence the bare soil spectrum in such a way that also the NDVI changes, or that only soil brightness is affected, without actually modifying the NDVI. In both cases there may be an effect on the NDVI of vegetation-covered soils, since NDVI is known to be sensitive already to soil brightness differences alone. In this respect, SAVI has been found to perform better, and I wonder why this index was not considered as an alternative?

Technical corrections:

Replace "physical based" by "physically based" (everywhere)

P 1976 L 6: by as (what should it be?) P 1976 L 14: paragraph » section P 1977 L 1: as following » as follows P 1977 L 5: 5 » 0.5 P 1977 L 15: As alternative » As an alternative P 1978 L 10: by canopy » by the canopy P 1978 L 12: inverse » complement P 1978 L 25: with high » with a high P 1978 L 30: "is run in the forward way, simulating" » "is run to simulate" (the model can only be run in the forward way!) P 1979 L 7: "was uniform, therefore" » "were uniform, so that" P 1979 L 27: According to the definition in Eq. (3), this is just the root mean squared error (RMSE), so the word "relative" should be removed in this sentence. P 1981 L 27: reflection » reflectance P 1982 L 2: is » are P 1983 L 14: "The high spectral resolution of the sensor" » "The sensor" P 1983 L 22: on the 18 July » on 18 July P 1984 L 26: "This method was preferred due to insufficient accuracy in land surface temperature retrieval that was noted over certain land cover types (Sobrino et al., 2007) when applying the standard TES algorithm" » "This method was preferred over the standard TES algorithm due to

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insufficient accuracy in land surface temperature retrieval that was noted over certain land cover types (Sobrino et al., 2007)" P 1985 L 29: meaning the » meaning that the P 1987 L 22: in near infrared » in the near infrared P 1990 L 1: Even though, the » Even though the P 1990 L 10: case of vineyard » vineyard case P 1990 L 12: exhibit in early growth stages » in early growth stages exhibit P 1991 L 7: realistic » realistically P 1991 L 11: from » by P 1991 L 16: of » with P 1991 L 17: differences from » differences ranging from P 1992 L 14: land cover » land covers P 1993 L 10: over the empirical » over empirical

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