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Hydrology and Earth System Sciences Discussions

Interactive comment on "Temporal variations of evapotranspiration: reconstruction using instantaneous satellite measurements in the thermal infra red domain" *by* E. Delogu et al.

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The paper addresses an integral component of satellite based evapotranspiration modeling. The extrapolation from instantaneous measurements to daily evapotranspiration is central to ET modeling. Some algorithms for ET modeling use the EF concept and method to extrapolate from instantaneous to daily ET, e.g. (Bastiaanssen et al., 1998; Roerink et al., 2000; Su, 2002). Furthermore the paper explores the issue of ET interpolation. The concept and efficacy of the EF has been a subject of discussion in some circles. It is interesting that in this paper that the EF method performed well. Thus this paper makes a significant contribution to evapotranspiration studies and Hydrology and

Earth System Sciences in general. I hereby recommend that this paper be published upon making revisions and clarifications as outlined below:

Structure

A key issue with this paper is that the paper is not well written and structured. The authors should address the structuring and presentation of this paper before it is published. The section headings do not cover the issue of a discussion.

Abstract

The abstract should be revised to highlight some of the key findings and comparisons in the paper. For example instead of saying just saying, "...with a clear advantage for the evaporative fraction..." the "clear advantage" can be supported by salient error statistics presented in the paper.

Title

I think the title of the paper can be revised and simplified to bring much more focus on the important issues in the paper.

Introduction

Whilst it is commendable that the authors attempted to present a detailed review of previous work in the contextualisation of their work, the introduction is a bit too long and winding. Some aspects of the introduction can be left out of the paper without changing its quality. For example, whilst I understand why the authors wrote about MISTIGIRI proposal (Pg 1702, Line 13 – 18), the information is not very important in the context of this paper. It can be left out, and the quality of the paper will not be affected. There are other sections that can also be left out. I recommend that the authors revise and summarise this section.

Materials and Methods

The readability of this section is seriously affected by the non use of standard terminol-

ogy and symbology. Revise!

-Rephrase Pg 1708 Line 1!!

-LETpd? If it is potential ET why not just use ETp? Ultimately, this leads to difficult phrases that imply something that is not 'standard' and difficult to comfortably conceptualise, for example a phrase like observed potential LE (Pg 1717) used in later sections of the paper.

-State how close the soil heat flux plates were to the ground, in terms of cm.

-As you did with the radiometer, also mention the name of the EC system(s)? Were they (EC systems) the same across the different study sites? Just highlight that!

-Repetition – Pg 1709, Line 16 to 23!

-Pg 1710, Line 3, Mean Error (ME) and Root Mean Square Error (RMSE) not "mean error and RMS error".

-Exactly how many sites were analysed in this paper? Clarify this! The number of sites seems to change throughout the paper. At some point the plots or sites appear to be five (5) and then later the sites are said to be eleven (11).

Overpass Time

Your overpass time results are really interesting. Is the time used in the paper local time or GMT? Can you comment on the implications of the results for ET modeling using satellites that have a mid-morning overpass time?

Figures and Tables

Overall, the figures and tables presented help communicate the research results. However, revisions and adjustments need to be done as follows;

-Add a map of the study sites!

-Improve the figure captions – some of the captions are not well presented and are

seemingly leading. Caption of Fig 4 and Fig 2 should be rephrased in a fully descriptive manner.

-Labelling of axis. The labelling of the X and Y axis should be improved. For example the Y-axis of Fig 4 needs improvement.

-The presentation of figure 4, including the colour scheme can do with a bit of revision.

-Figure 5 and Table 4 :– "simuled" should be simulated!!

-Figure 7 :– add "variable method" in the caption.

-Table 3 :– Nash Sutcliffe Efficiency not "Nash Efficiency"

-Table 4:- why not add the error statistics? It will surely help in your discussion

-Pg 1716, Line 17, It could be a good idea to present a figure that shows the overestimation.

Abbreviations

Abbreviations should be written in full when used for the first time. Some of the abbreviations are not written in full anywhere in the paper. Abbreviations that should be reviewed are: IRT, AASTR, MODIS, NDVI, & CNES.

Technical corrections

Pg 1701, Line 4 – Spells not Spills

Pg 1702, Line 19, reads better with another 'or' in between noon and in. . . and use late in the morning not "in late morning"

Pg 1704, Line 8 – Instead of saying, "these authors", write the authors, cite them! There too many cited authors in the paper to just say, "these authors". Which authors?

Pg 1706, Line 6, I am not sure whether a fortiori has been used correctly here, If it has been used correctly, write it in italics!!

Pg 1706, Line 6, do not use "..." as done in the brackets! If you know more operational constraints state them.

Pg 1706, Line 21, Materials and Methods, not Material and methods.

Pg 1708, Line 23, South Eastern not "South Easter France"

Pg 1708, Line 25, "...and production of full crop rotation", this is not comprehensible! Revise!

Pg 1709, Line 6 -7, Rephrase!

Pg 1710, Line 22 -24, Rephrase the lines, "The model... on sites)."

Pg 1711, Line 1, which following methods? Revise!

Pg 1712, Line 4, variation of the Jackson et al (1983) not "...variation of the (Jackson et al 1983)."

Pg 1712, Line 23, remote sensing data and information not "remote sensing informations"

Pg 1714 Line 12 -13, Rephrase the sentence that includes, "...for consistency for the combination of interpolation and extrapolation in order to...."

Pg 1717, Line 5, change "Nash efficiency" to Nash Sutcliffe Efficiency

Pg 1717, Line 15, observed LETp??

Pg 1718, Line 23, The Nash criteria - replace with Nash-Sutcliffe Efficiency

Pg 1718, Line 23, Use evaporation reconstruction not reconstitution!!

Pg 1718, Line 24-6, rephrase the sentence, "...: the furthest the time of day... is taken into account". These sentences are not very readable

Pg 1718, Line 25, "relevant" is not a suitable word. Change it to effective or appropriate or any other suitable word.

Pg 1722, Line 24, "...data tested are relatively little stressed". Revise!! Suggested revision, "... data used showed or has few stress periods".

Pg 1724, Line 5, later or latter? Rephrase the whole sentence.

RWASOKA DT

REFERENCES

Bastiaanssen, W.G.M., Menenti, M., Feddes, R.A. and Holtslag, A.A.M., 1998. A remote sensing surface energy balance algorithm for land (SEBAL). 1. Formulation. Journal of Hydrology, 212-213: 198-212.

Roerink, G.J., Su, Z. and Menenti, M., 2000. S-SEBI: A simple remote sensing algorithm to estimate the surface energy balance. Physics and Chemistry of the Earth, Part B: Hydrology, Oceans and Atmosphere, 25(2): 147-157.

Su, Z., 2002. The Surface Energy Balance System (SEBS) for estimation of turbulent heat fluxes. Hydrology and Earth System Sciences, 6(1): 85-100.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1699, 2012.