

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

Anonymous Referee #2

Received and published: 20 March 2012

This paper deals with the very relevant issue of how the time of day of image capture can impact on an evapotranspiration estimation through 1) the extrapolation of an instantaneous measurement to a daily evapotranspiration estimate and 2) the interpolation of daily estimates to seasonal estimates. It is reported that instantaneous methods using the EF and SF method perform similarly when reconstructing daily ET, however under certain conditions (water stressed) the EF method outperforms the SF method. Further, it is reported that estimates made at noon are underestimated to a lesser extent than estimates made earlier or later in the day. Interestingly, increasing the revisit time from 1 to 10 days does not significantly impact on seasonal estimates.

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These are important findings and should be published. These findings impact on the choice of both the methodology and the choice of satellite imagery that should be used for a study of this nature due to image capture time and revisit time. It also finds that under differing conditions (water stressed versus non-stressed), one method may be more accurate than others. Taking ET research methods into the operational domain depends on adequately resolving these issues.

Unfortunately, I found the paper very difficult to follow. The style and structure of the paper needs to be adjusted to make it easier for the reader to follow. The methodology presentation is complicated as it consists of two methods which run in parallel (The SF and EF method for instantaneous estimates), and then culminates in the testing of both methods as input into the extrapolation of seasonal ET, while at the same time assessing the impact of revisit time on these seasonal estimates. Further, the authors do not appear to have followed accepted norms for what should be included in each section of the paper which adds to the difficulty for the reader.

The authors should consider illustrating with Figures to help the reader follow the methodology and relate this to subsequent sections and/or consider having consistent numbering/ headings in the text. The authors may also like to consider the main headings in the paper and shuffle the text around to the most appropriate section. In particular, I would suggest having a section on literature review as there is good reference to relevant literature which is included but since it appears in sections such as the methodology, it becomes cumbersome to read. It may also be useful to keep the materials section separate from the methodology and include a map indicating where the study sites are located. Further, this paper could greatly benefit from a discussion section. This would allow for much of the text to be removed from both the methodology and the results section and these sections may be more concise and easy to follow. It is my opinion that much of the value this paper brings should be presented as part of a discussion section.

I believe the paper will generate interest amongst the remote sensing ET community

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and therefore before the paper is published, I suggest that the authors relook at the structure of this paper as this will improve its readability and therefore greatly increase its impact.

Specific edits below: The title is a little clumsy, I suggest: "Temporal variation in evapotranspiration: a comparison of patterns derived from thermal infra red domain".

Pg 1703, ln 8: Replace (Allen et al., 1998) with: Allen et al. (1998).

Pg 1704 , ln 8 : Replace theses with: these.

Pg 1705, ln 3: Replace presented the greater performances with: performed better.

Pg 1705, ln 26: Replace say with: for example.

Pg 1705, ln 29: avoid the use of the first person.

Pg 1706, ln 5: Replace contrarily with: contrary.

Pg 1708: ln 1: Replace than with: as.

Pg 1708, ln 9: LETp is undefined.

Pg 1710, ln 10: write R_{atm} out in full to be consistent with other inputs in the model.

Pg 1711, ln 6 – 12: On what basis was a “large deviation” established. This appears subjective. Can this be expanded on?.

Pg 1711, ln 18: Replace were with: have been.

Pg 1712. ln 2: orchard is misspelt.

Pg 1712, ln 20: vegetation is misspelt.

Pg 1712, ln 22: Replace informations with: data. Pg 1713, ln 13: Replace are meant with: strive.

Pg 1715, ln 9: The sentence starting with Assuming is not a sentence. Reformulate.

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Pg 1716, ln 6: the word the is repeated.

Pg 1718, ln 2 & 3: reporting the RMSE as being about 0.60 and about 0.81 is strange. Remove the word about.

Table 1: The column Max LAI period is not explained anywhere. Is it significant or can it be removed from the Table?

Table 2: Is this Table necessary?

Table 3: MAE is undefined

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

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