Interactive comment to "Inter-comparison of four remote sensing based surface energy balance methods to retrieve surface evapotranspiration and water stress of irrigated fields in semi-arid climate"

My review will follow the guidelines as defined at http://www.hydrology-and-earth-system-sciences.net/review/ms_evaluation_criteria.html.

1. Does the paper address relevant scientific questions within the scope of HESS?
Being able to accurately reproduce the latent heat of evapotranspiration has been a long sought objective in the hydrologic community for many decades. For this reason, any contribution that brings us that much closer to solving this question is addressing HESS's objectives. This is especially relevant in water-stress prone areas as the one depicted in this study, where the concept of potential evapotranspiration is far away from what is happening on the ground.

2. Does the paper present novel concepts, ideas, tools, or data?
The paper offers a thorough comparison of a number of remote sensing models in a region that is not normally studied very often with these models. Even though they don't suggest substantial improvements to the models, just the fact that they are using the new network provides sufficient reason for this paper.

3. Are the substantial conclusions reached?
Yes.

4. Are the scientific methods and assumptions valid and clearly outlined?
3.2.1 – I understand that EC sites have budget closure issues. In your case, the budget closure seems to be substantial. You do mention towards the end of the paper that the lack of long-term measurements means that you didn't have the time to correct the mistakes that a long-term network might have. Is there any additional information about your site that you could provide that addresses why the budget closure problems might be so high? I'm not looking for definitive statements, but trying to understand why it is that poor given the environment would add value to the interpretation.
Also, your choice of closure adjustment method seems very subjective. Could you give a little more insight into why you choose the method for each site? It's hard for me to believe that towers that are that close together would not act the same way in terms of budget closure.
3.3 – You do quite a good job at explaining the different models. I feel like I am able to understand the differences clearly after reading about the four models.
4.7 – When I started reading the spatial variability I got excited to see how the models compared spatially but I was let down. You only spend 3 paragraphs on this topic where you could spend much longer. I think this is a lost opportunity, please expand.

5. Are the results sufficient to support the interpretations and conclusions?

The results do support the conclusions and interpretation. However, I think there a missed opportunity to explain what is going on. By this I mean that you should dig a little deeper into why the models can be failing. You touch on the senescence issue but could you go a little further in proving this point? What about the time period in which you don't have these problems? I don't know how they perform then and if they improve substantially. There is a lot more going on there that you don't mention. I'm not looking for a complete explanation of the errors but more than just the senescence argument would be good (i.e. input data uncertainties, model uncertainty, parameter uncertainty…).
You don't need to redo the analysis completely, but it would be good to add a little more context to saying that the main problems are due to the senescence. I would hypothesize that most of the errors come from the model parameterization and the remote sensing uncertainties. Feel free to prove me wrong.

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)?
The authors properly describe all the data sets that they use so it should be possible to reproduce the results. One suggestion is to discuss how you fit parameters to a lot of the parameterizations that you use (i.e. LAI relationship). If I were given your original data could I reproduce the input data and parameters by using this paper as a guideline?

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution?
Because their work is based on a new network of eddy covariance sites, it is obvious that the work is original. They suggest improvements to deal with the senescence issue.

8. Does the title clearly reflect the contents of the paper?
The short answer is yes. That being said, I would suggest shortening the title if at all possible.

9. Does the abstract provide a concise and complete summary?
The abstract does summarize well the main points of the paper. However, it could use some refinement. What you say in the abstract could be said in 75% of the number of words that you use. I would give preference to work on making it more concise before adding any new information.

10. Is the overall presentation well structured and clear?
The introduction (State of the art + Context and Objectives) should be put into one section and should be shorter.

11. Is the language fluent and precise?
I don't have any complaints about the grammar. My major complaints are the very long sentences and odd phrasing. I would comment them here but there are too

many and a lot of the information would be redundant. I would suggest having a native English speaker read through it to point out the main issues.

12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?
Yes.

13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?
0. Abstract – Too wordy.
1. The introduction should be shorter and more concise.
2. You need to work on the size of the figures. They seem to be all over the place. Figure 8 is massive. The reader will get the message with a smaller version. Along those same lines, could you include other plots and metrics to compare the surface fluxes? I think it would be much more informative.
3. The spacing in Figure 11 looks odd.

14. Are the number and quality of references appropriate?
This is fine. No suggestions here. If anything, there are too many references in the introduction. But I wouldn't worry about it.

15. Is the amount and quality of supplementary material appropriate?
No suggestions here.

TAKE HOME MESSAGE –
Overall, I think the paper does a great job at using high-resolution remote sensing information with a suite of state of the art remote sensing ET models. You get that message across clearly and well. My main suggestions are the following:

1. Make everything much more concise. You ramble sometimes and lose your audience. This could help in your introduction, abstract, and certainly your results.
2. Work on your phrases. Some just seem odd in English.
3. Expand on the results and discussion section. This is a missed opportunity. This is where you should prove to me that you understand the models thoroughly and given the assumptions the argument of why I should you these models in the future.
4. I don't see a definitive statement of which model I should use. Please make the case for one of them and explain why. The answer could always be that it depends on the scenario. You touch on this briefly, but it would be good to expand.