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Hydrology and Earth System Sciences Discussions

Interactive comment on "A dual-pass data assimilation scheme for estimating surface energy fluxes with FY3A-VIRR land surface temperature" *by* T. R. Xu et al.

Anonymous Referee #2

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The main issues that were raised regarding the first submission have not yet been addressed. Hence, I recommend that the paper be rejected.

Specific major issues are listed below. There are also minor issues that I have not listed here, since many of these were mentioned in previous reviews.

Lack of originality:

This study does not make a significant new contribution, given its similarity to Xu et al 2011b. The main difference between this study and the previous one is in the timing of the parameter update, and yet these parameters do not change much once spun up (also the parameters do not seem to influence the reported statistics, according

to Figure 10). Hence the change in the timing of the parameter updating is expected to have little effect on the assimilation output. The paper does not include any discussion of how this study differs from previous studies by the same authors, nor any justification of why the methods were changed from previous studies (I suspect some of the discussion of the previous studies has actually been been removed in the latest submission?).

Treatment of bias:

The idea behind dual pass filters such as this one is to correct the model-observation bias by updating the model parameters, and then correct the remaining *random* error through data assimilation. As stated in previous reviews, it must be ensured that the assimilated observations are not biased relative to the parameter-updated model. Then the reduction in random errors from the model state update should be demonstrated.

However, Figure 10 shows that the model parameter update has very little impact on the model bias, while the (bias blind) assimilation decreases the biases. The scheme is not then working as intended at all.

From the statistics presented it is also not clear whether there is any improvement in the model forecasts, other than the improvement in the biases. While the correlations are presented, the improvements in correlation are likely due to changes in the diurnal cycle associated with the changes in the bias (see Fig 3).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 3927, 2013.