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Hydrology and Earth System Sciences Discussions

Interactive comment on "Using a thermal-based two source energy balance model with time-differencing to estimate surface energy fluxes with day-night MODIS observations" *by* R. Guzinski et al.

Anonymous Referee #2

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I had the pleasure of reading your manuscript. The research described is highly relevant and the manuscript is well written. However in my opinion there are some open issues that need clarification.

While the paper focusses on the a dual source method, a small overview of current one-source initiatives should be provided for, as there are currently several large scale initiatives that investigate the use of one source models. In my view the most important part, namely the adaptation of night time fluxes, should be put more clearly forward, in terms of positive impact and negative impact. In both the summary and the conclusion

more focus is put on the scheme for estimation the green vegetation fraction.

You state that on page 1916 (paragraph 4.2) that when nocturnal fluxes are modeled, the accuracy of the instantaneous values of H are improved, but the accuracy of daytime values of H are decreased. This is one of two reasons that you omit in the final version of the algorithm the calculation of nighttime fluxes. However no explanation is given why this discrepancy is their from a physical aspect. A more critical view of this discrepancy is required. In addition the differences here are shown in percentages while a RMSE value might also be very illustrative. You attempt on page 1917 a sensitivity analysis with a temperature bias of 5 degrees. However there is no explanation why this particular value is used. Considering a smaller bias might cause the full version not to revert to Eq 6 in case of positive bias. Also the information you provide on P1910 that lower errors occur at night time that on day time is not used here.

Finally, the discrepancy between fg_observed and fg_vi (shown in p1915) is not mentioned within the conclusion, while and consequently a better accuracy is proclaimed than achieved in the final version of the algorithm.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 1897, 2013.