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Hydrology and Earth System Sciences Discussions

Interactive comment on "On the water thermal response to the passage of cold fronts: initial results for Itumbiara reservoir (Brazil)" *by* E. H. Alcântara et al.

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1. Referee #1: The definition of cold front is vaguely used in this paper.

Authors: In attention to your comment we have added the following definition: " A cold front can be defined as a weather condition in which a moving atmospheric mass of cold air pushes into a mass of warm air resulting in a fall in temperature and air pressure. The warmer air interacts with the cooler air mass along the boundary, and usually produces precipitation".

2. Referee #1: I am not sure if it is correct to use satellite images to show the evolution

of the cold front through identifying cloud patterns since high clouds are many hours later than cold front arrival.

Authors: In fact we agree with you and we have write that the cloud cover formation observed in the satellite imagery is only to see the evolution of cloud cover. Also we have used the meteorological data to identify the front passage.

3. Referee #1: Many processes (similar to those stated in this paper) associated with the influence of cold fronts on meteorological variables and fluxes have been extensively over large inland waters in North America (e.g., Blanken et al., 2000; Lenters et al., 2005; Liu et al., 2009). Surprisingly, those studies were not cited and compared here.

Authors: We have read the proposed literature and we have inserted as a reference paper.

4. Referee #1: How did they account for the influence of stability on the flux exchange in their equations (4) and (5) which use the constant coefficients of turbulent exchange? However, stratiïňĄcation is proven to be very important in controlling ïňĆux in association with cold front passage (Blanken et al., 2000; Liu et al., 2009).

Authors: In fact we do not calculate the atmospheric stability (i.e. Monin Obukhov length) in this paper and do not change the neutral values of the coefficients. Using the same references that you proposed to us, all of them shown that the atmosphere became unstable during the cold front passage. For future work the estimation of stability and coefficients will be done.

5. Referee #1: Is it possible to do more quantitative analysis about the inïňĆuence of cold front passage on ïňĆuxes and meteorological variables in Section 3.3, using their hourly data.

Authors: We agree that is possible to do more. However, our analysis meet the proposed objective.

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6. Referee #1: It seems to me that the stripped area in Figure 7 doesn't correspond to the passage of cold front. It should be earlier to me? It needs to be double-checked, probably using their half hourly data. Check this for other ïňĄgures.

Authors: We agree and we have changed as advised.

7. Referee #1: Wind intensity?

Authors: Wind velocity, if you prefer.

8. Referee #1: The paper needs to be re-organized. There are a lot of grammar errors. Some sentences don't make sense to me.

Authors: The paper was re-organized and double-checked in English language.

9. Referee #1: Some ïňĄgures are too small to me to read.

Authors: The size are adequate. Maybe the conversion from MS to PDF by HESSD has caused this problem.

10. Referee #1: Can contour lines be used in Figure 11. It is difficult to read the color differences.

Authors: We have made tests and this is the best way to show the result.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 9437, 2010.