

## ***Interactive comment on “The Interactions between Soil-Biosphere-Atmosphere (ISBA) land surface model Multi-Energy Balance (MEB) option in SURFEX – Part 2: Model evaluation for local scale forest sites” by Adrien Napoly et al.***

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Comment : I suggest a modification of title according to this last remark: The Interactions between Soil-Biosphere-Atmosphere land surface model with Multi- Energy Balance option (ISBA-MEB) in SURFEX – Part 2: Introduction of litter formula- tion and model evaluation for forest sites.

Answer : In accordance with both referee suggestions, we have modified the title to : “The Interactions between Soil-Biosphere-Atmosphere (ISBA) land surface model Multi-Energy Balance (MEB) option in SURFEXv8 - Part 2: Introduction of a litter for-

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mulation and model evaluation for local scale forest sites”

Comment : P3 l90: “the” in excess

Answer : corrected

Comment : P4 l92: reference when introduce DIF option

Answer : the reference has been added

Comment : P5 l126: “that” in excess

Answer : corrected

Comment : P5 l155: is there a condition in residual term such  $res \geq 0$  ?

Answer : We did not apply such a condition. We assume (as seems to be the case generally in the literature as far as we can tell) in the correction method that it is H and LE that are underestimated compared to the available energy  $R_n - G$ , but indeed, we understand the relevance of the comment. To explore the sensitivity to this condition, we plotted (see fig1.png) the adjusted sensible heat flux just as it appears in Figs.6-8 for the three sites. Blue curves are plotted using the correction method of the paper and green curves are plotted by only computing the corrections when  $res \geq 0$ , otherwise the turbulent heat flux are not adjusted. Fig1.png shows that the differences are quite small between these two methods and mostly occur during nighttime when the fluxes are relatively weak. We checked the statistics and differences are slight and don't change our conclusions.

Comment : P7 l212: reference when introduce ECOCLIMAP database

Answer : The reference has been added

Comment : P9 l272: ‘is’ in excess

Answer : corrected

Comment : P9 l274: is it possible to precise “veg” default value for forests

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Answer : the parenthesis is replaced by : “which is constant in time for forests and varies between 0.95 and 0.99 as a function of the forest cover type”

Comment : P9 I287: suppose fig. 3c instead of fig. 3B

Answer : Indeed this is an error and has now been corrected.

Comment : P11 I359-361: Fig2 don't present very clearly that both MEB simulations simulate less ground evaporation compare to ISBA, even for MEBL. I suggest to moderate affirmation or link comment to another figure or table.

Answer : Thank you for this comment, there was a little confusion here. We removed the reference to the figure and better explained that this sentence refers to summer time. We replace these lines by “During this period, both MEB simulations simulate considerably less ground evaporation (about 4 % of summer LE) compared to the standard ISBA simulation which simulates 25 % of summer LE as ground evaporation.”

Comment : P13 I431: ad “at different depths” after soil temperature

Answer : added

Comment : P16 I523: I suggest justifying here why only MEBL is considered here.

Answer : We changed this sentence to : For improved clarity, only the MEBL and the ISBA models are compared here, since the previous evaluation showed the consistent improvement of using the litter option when using MEB for forests.

Comment : Legend Table 3: change “indicates that figures come from” by “indicates that values come from”

Answer : changed

Comment : Figure 2: precise if it is partitioning for a specific year or mean of many years

Answer : The years have been added in the legend

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Comment : Figure 4 and 5: there is no unit on Y-axis

Answer : this has been done, the figure has been modified accordingly

Comment : Legend figure 4: “indicated” and not “indciated”

Answer : corrected

Comment : Figure 7: a,b,c indication are missing

Answer : this has been added

Comment : Figure 9: For total WG, please precise soil thickness used to calculus

Answer : we modified the first part of the legend into : “The total soil water content calculated over the root depth indicated in Table.2 ”

Comment : Figure 10: G RMSE in legend, H RMSE in Y-axis legend. Need to be the same. Litter thickness is in 10-2m, not in m.

Answer : “H” has been replaced by “G” in the text and the units have been corrected

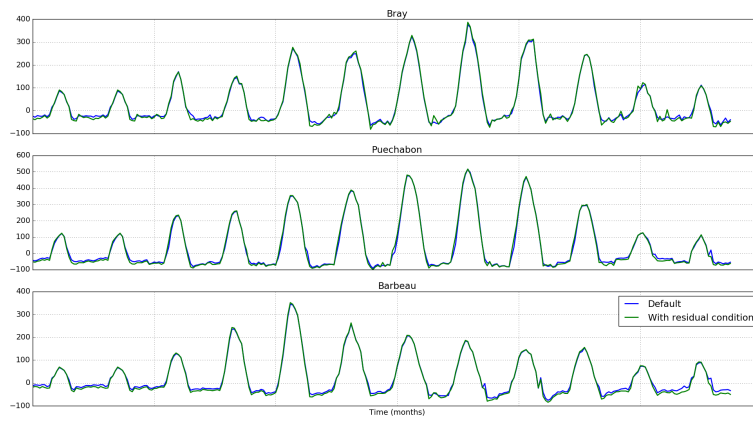
Comment : Figure 14: Precise H and LE in Y-axis title

Answer : corrected

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Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-270, 2016.

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**Fig. 1.**