

Evaluating cloud properties in an ensemble of regional on-line coupled models against satellite observations
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This paper is an evaluation of six simulations over Europe against satellite observations. It includes three different models with one that has three different combinations of microphysics, radiation and aerosol parameterizations. The evaluated variables are cloud fraction, cloud optical depth, cloud liquid water path and cloud ice water path. The results are interesting since these quantities are an important source of uncertainties in atmospheric models. However, major revisions are needed to clarify the text, tables and figures; and additional information is needed to complete this evaluation, both for the observation and for the model analysis.

This is the 2nd revision.

General comments:

- A significant amount of work has been done for this round of corrections and it clarifies notably the text and the ideas. However, some work is still needed in the analysis, particularly when linking biases to effective radius.
- Again, as mentioned previously, Mean Absolute Error does not add any information for the analysis. Whenever it is mentioned in the text, it is to emphasize that the values have the same maxima as the bias. Moreover, many figures of MAE have scales from -50/-40 to +40/+50... how can it be negative based on equation 2? Figure 7 is not even mentioned in the text. Removal of these figures should be considered seriously even if no other metrics is proposed as an alternative.
- Figures should be following the order that they are mentioned in the text.
- In the satellite data, a strange line or a discontinuity appears around 60N (with very high values in very small locations, particularly for JFM, OND). Is there some problem with the retrieval around this area? If so, it should be mentioned in the text.
- 3.2 the fact that the UK4 simulation has the smaller IWP biases but only has one ice category is exactly the reverse of the argument there. And there is no mention about the other models, how many ice category do they have?
- 3.3 lines 15 and after: this analysis is not clear at all. The reference to Tiedke does not seem to fit in the argument. Why is the data not available over Northern Africa?
- If LWP and IWP are “all-sky means”, these variables biases will include the CF biases. This could be the main differences between the simulations. One has to be very careful about over interpreting the LWP, IWP and COD biases when it includes the CF biases. That is the main weakness of the article.
- The links between effective radius and biases seen in LWP is weak if not even erroneous. The impact of effective radius will be on COD, but the author has to keep in mind that contributions from CF, LWP and IWP are also important to the COD biases.

Specific comments:

- The authors mention that they removed subtitle from the figures but it is still there and still too small to be read. This should be removed.
- Introduction, line 31: remove “they did not find any conclusive evidence”
- Introduction, last phrase: rephrase to removed “we”
- 2.2 last paragraph: is the -114 g/m² bias is the mean bias against DARDAR? If it is, it can

change a lot of the interpretation of that variable. More details about these biases should be provided.

- 3.1, line24: do you mean between 0 and 1 %? please, clarify.
- 3.1, line 4 and 5: not coherent bewteen -35% and -40%
- Please remove figure 2, as the text explain it well, it coincides with the bias!
- 3.1, line8-10, please rephrase since it seems that the explanation is redundant.
- 3.1, last phrase: the highest correlation is over land... what is the argument there?
- 3.2 please put the figures in order that they appear in text.
- 3.3 : rephrase line 10-12 and clarify the general idea.
- Conclusion: line 28 and line 30: the reverse is stated between the two sentences. The argument for the IWP and the number of ice categories does not hold.
- Conclusion: lines 6-9: the argument that a smaller effective radius is responsible for a higher LWP does not hold. This whole argument should be kept to the interpretation of COD biases, but keep in mind that contributions from CF, LWP and IWP are important to the COD biases (lines 14-22).
- Conclusion line 30: Where is the conclusion about Morrison's scheme comes from? The IWP biases do not show that.
- Conclusion, last phrase: “we help to show”. Please rephrase.

Technical points:

- 2.2, line 18: remove “ utilised”
- 2.2, line 19: unclear: “which forms part”
- 2.3, line 13: “valuation”, line 14: werw
- 2.3, last phrase: re-phrase
- 3, line 11: “provides” should be replace
- 3, line 12: removed “are presented”
- 3, last phrase: removed
- 3.1, line 7: “a nhe” ?
- 3.2 line 29: “progrosticked”, do you mean diagnostic or prognostic?
- 3.2 ice hydrometeor categories
- 3.3 line 13: removed “ included”
- 3.4, line 26: “vales”
- 3.5, line 28-29: rephrase
- 3.5 line 2: rephrase “pervasively”
- conclusion, line 31: “MAjor”