

Interactive comment on “Impact of humidity biases on light precipitation occurrence: observations versus simulations” by Sophie Bastin et al.

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1 Abstract

This study evaluates the performance of a number of regional climate models to reproduce humidity and precipitation. The emphasis of the article lies on the evaluation of Integrated Water Vapor (IWV), as well as its relation with temperature and finally with precipitation. It is found that models tend to overestimate the lower values of IWV, which is closely related to the "drizzling effect", i.e. too often too low precipitation.

C1

2 General comments

I find this an interesting piece of work. The authors have made an effort to collect and put in comparable terms an heterogeneous set of data, from models to different observed variables at different locations and with different temporal availability. The use of an ensemble of simulations is a particularly good choice, as it provides robustness in the findings. I also like the fact that the authors do not just compare models with observations in plain terms, but they describe a simple two-layer atmosphere model that allows them to modelise the relationship between IWV and relative humidity with temperature, which allows them to gain insight on the sources of model biases. The text is well written and is easy to read, and the conclusions follow from the analysis carried out. Therefore I have only found very minor issues that the authors might want to consider.

3 Specific comments & Technical corrections

1. Pag. 6, line 23: has been → have been
2. Pag. 7, line 1: consists in → consists of
3. Pag. 7, line 34: Due to the existence of gaps in the observational dataset, which reduces...
4. Pag. 10, line 18: valeurs → values?
5. Pag. 11, line 20: I'd suggest that s , in $Q_s(T)$ to be called subscript, not exponent. An exponent is something else
6. Pag 10, line 28: Why do we have that $Q_s(T_{FT}) \approx \alpha Q_s(T_{BL})$? It is not obvious to me.

C2

7. Pag. 12, line 8: What is T_{b1} and T_{b2} ?
8. Pag. 12, line 33: What is SD?
9. Figure 5: Should the right panel in the first row be labelled d? Further, that panel has particularly low resolution and generally lower presentation quality than, let's say, Figure 4
10. Figure 6: The same applies here. The first panel has bad quality and different aesthetics. I'd advice to follow the style followed to produce Fig. 4
11. Figure 7: the lines surrounding the panels are partly hidden by them and produce an ugly effect that should be avoided in the final version of the manuscript
12. Figure 9: The panels could be larger to take better advantage of the available space. Unlike in the other two, the third column has no right and top axis. The labels in the first row overlap with the axes. The low resolution issue applies here as well. There is no legend.

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