

Review of the manuscript “Comparing two years of Saharan dust source activation obtained by regional modeling and satellite observations”

In the phase of the quick access review, I already made a full paper review (see listed below). I invite the authors to address to those of my questions that they did not yet consider.

The manuscript “Comparing two years of Saharan dust source activation obtained by regional modeling and satellite observations” compares simulation of a regional dust model with observations. It analyzes capabilities and weaknesses of the model simulations, representing so an important guidance for model validations of a similar kind. A particular intension is paid to model treatment of dust emissions and the influence of mesoscale atmospheric systems such as low-level jets and cyclone passages.

The paper is well-written and clear and the model experiments and observation evidence well documented. Before this work is published I still want to address to the authors a few comments and advices as listed below:

- Model results are compared against four AERONET stations mainly distributed over Western Sahara. I suggest that the validation is extended by including more AERONET stations belonging to the model domain.

- It is somehow unexpected that the model behaves much better against one observation type and underperforms against the other one. More elaboration on that issue could be appropriate.

- Pg 11 The authors state:

This strong underestimate is likely due to failures in the model to reproduce the meteorological conditions correctly that lead to dust emission upwind of this location at this time of the year. It could be either due to dust emitted by wet convective events, which the model does not reproduce, or due to insufficiently resolved topography resulting in incorrect wind fields in this mountainous area.

I should add that among suspected reasons could be the emission scheme as well. In fact, it is difficult to hypothesize a possible cause unless a sensitivity experiments are evaluated for a selected dust storm cases in the region. The same argumentation could be applied to other cases when the model fail to well reproduce the observed conditions. A need for additional close-up case studies could be a recommendation for future modelling studies.

The manuscript title mentions satellite observations only, although AERONET data was also used for comparisons. An appropriate correction is suggested.