Review of "The Impact of Aerosols on the Stratiform Clouds over southern West Africa: A Large-Eddy Simulation Study"

Summary

The authors have included more comparisons, relevant technical details, as well as cleaned up confusing statements, improving the manuscript from its previous version; however, I find that some questions were not fully addressed. From my side, some of them were aimed to ensure that the work is reproducible, so I'm including them in minor comments. Regarding the grammar and style of the manuscript, there is still room for improvement. Nevertheless, their work is still highly relevant and the scope of the paper is now more clear.

Minor comments

- The work is structured in a first part where the REF case is validated, and a second part where the aerosol experiments are performed. I suggest minimizing the description of the REF case as much as needed. For example, I don't see any use of reporting how much is the temperature at cloud top in every hour of the simulation. The relative differences between model results and observations are key but too much description is overwhelming for the reader, what is really useful from there?

- One of the interesting findings of this work is pointing towards how a polluted scenario can increase spatial cloud variability, which was reported as a research gap in the Introduction. I don't think this is clearly stated in the abstract right now. It motivates it around L30 and then it does not mention spatial variability again. The conclusions summarized it better. Was this process observed/reported in other studies?

- Following this topic, it may be worth exploring how different are the trajectories of the POL, REF, and CLEAN cases in a space defined by cloud fraction and reflectivity. This could support the description around L695.

- Are there observation based reports finding that solar variability is also greater for more polluted cases?

- Some of my previous comments were aimed towards documenting details of the setup so that the work can be reproduced rather than questioning if they were correct. I'm bringing back some of those topics so that you can evaluate if they can be included:

  - What are the initial conditions of this run like?
  - How are the vertical profiles created? Just applying the nearest value to the corresponding grid height? Or is there any averaging performed?
  - I now see that the subsidence velocity is quite high, is this typical of this region? Or was that needed in order to control PBL growth to match observations?
  - The way to find the inversion is specific for this case, right?

- There is still room for improvement in the readability of the document. I suggest asking for professional help or using one of the many tools available for checking grammar and style. Below are included some suggestions but I didn't have time for a more thorough check.

- Fig. 5 is still stretched

- What is this increase of the vertical wind speed referring to in L525?

Typos / writing suggestions

- General/style: using more articles like "the" and "a" could help.

- L19 modeled or modelled?

- L35 lower?

- L39 break up

- L86 A large amount

- L120 is denote the correct verb?

- L124 highlighted

- L148-149 redundant mention to semi-direct effects

- L176-178 redundant mention to surface fluxes

- L273 portions

- L280 but they are

- L289 thermodynamic

- L299 layers

- L307 This last part of the sentence is a bit confusing.

- L324 you can include how much it varies: 400 to 1200 m

- L354 main goal

- L397 The spatial behavior of LWP

- L397 cloudy

- L404 Midcloud, CPP decreases...

- L405-406 less inhomogeneous or less homogeneous?

- L409 values

- L413 160:00 UTC.

- L420 add comma after domain

- L421 Locally? LOcally?

- L427 lower than

- L434 "almost" instead of "near"

- L464 observed at Savè

- L471 1°C is not much of a decrease, same for other statements in this section

- L488 maybe it's worth mentioning that these processes are not represented in LES

- L494 later?

- L515 Maintaining a stratus layer...

- L521 reduction

- L525 "and then its increase instead" of "it rises"

- L545 ...24°C while the cloud top temperature is 20°C

- L553 nearly

- L554 Based on the observations, do these upper clouds yield a lower observed solar irradiance?

- L562 ground temperature

- L562 I don't know if this is cloud break-up time, as clouds were indeed already broken then

- L564 I don't understand this well, is it related to the forcing tendencies?

- L580 cloud break-up

- L600 in depth

- L623 Break this sentence into shorter ones

- L639 What does "10 superior" mean?

- L666 decrease

- L695 account for

- L700 "but" instead of "while"

- L713 the inversion layer

- L758 more slowly

- L800 impact