

Interactive comment on “Spatiotemporal dynamics of fog and low clouds in the Namib unveiled with ground and space-based observations” by Hendrik Andersen et al.

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General comments

Andersen et al. present a study about the spatial and temporal patterns of fog and low clouds in the Namib. The present paper extends the knowledge gained from earlier studies via the combination of ground measurements (fog precipitation, relative humidity and cloud base height) with data from several satellite platforms (spatial extent, cloud base height and cloud top height). They investigate spatial, seasonal and temporal patterns. In the end, they derive a conceptual model for fog and low clouds in the Namib.

C1

The main conclusions in this study are generally comprehensible and well substantiated by the results. I congratulate the authors for deriving the very nicely summarising schematic of the seasonal FLC cycle. My main point to improve the paper in the revisions is that the information conveyed to the reader could be written in a more easily understandable and more concise way. Especially at the beginning, it was not obvious to me which phenomenon was referred to with “satellite observations differ from station measurements” as comparing ground fog measurements with satellite fog and low clouds observations obviously only tells half of the story.

The figures are nicely drafted and I only made a few suggestions to add small features which could facilitate it for the reader to grasp the content (see specific comments).

The text is carefully written, some details to improve are pointed out in the technical corrections.

Overall, the paper is understandable and interesting and I recommend publication after minor revisions.

Specific comments

0) Abstract

- P1L4-6: The sentence “...observed seasonal patterns derived from satellite observations differ from station measurements...” is misleading, it should be clarified that station measurements only observe ground fog.

1) Introduction

- P2L3-4: Again, it should be stated more clearly what kind of station measurements are compared to satellite data.

- P2L5: Explain better what you mean with “seasonal cycles of formation mechanisms”.

2) Introduction

C2

- I see a benefit in adding a small table or graph summarising the used datasets including availability (time period) and resolution (time and space).

- Section 2.3 is more difficult to read than the ones before. Shorter, less nested sentences could improve readability.

3) Results and Discussion

- Figure 4: I suggest to indicate the three separated regions from b) also on the map in a). And to me it is not obvious which data are comprised in one circle/triangle.

- The text could be somewhat sharpened: Eg P7L15: What do you mean with “distinct spatial patterns”?; P9L1: Which are the “subregionally different mechanisms”?; P9L3: Can you elaborate the relationship you are referring to in “FLC occurrence frequency...features a strong relationship”? → These sentences sound complicated but do not provide much information to the reader. My suggestion is to either delete them or explain more specific what you want the reader to know.

- P9L8: How do you interpret this discrepancy between the high- and low-level FLS season? Can you indicate the distance where FLS occurrence is below 5% in Fig. 5?

4) Conclusions and outlook

- P10L17: Do you want to say that satellite observations really “overestimate ground fog” or that based on these observations it is just not possible to distinguish between fog at the ground and low clouds lifted from the surface?

Technical corrections

- Overall: The term FLC is used inconsistently. Either use plural or singular and always use the abbreviation after it is introduced (eg P2L16+17).

- P1L8: This should be “25° S”, not “25° N” I presume.

- P1L9 and P8L1: Please explain “r”.

C3

- P2L1: patterns “of” fog

- P2L25: In Fig. 1a) the western boundary is 10°E. For consistency reasons, I suggest taking the same extent as in Fig. 2a).

- P3L9: Although correct, a reader who is not familiar with CALIPSO products might think that “level 2 5 km” is a typo. The sentence could be rearranged.

- P3L11: To my knowledge, dates should be written in the form “June 13, 2006”.

- P4L1 and L19: Indicate size also in km, for easier comparison with SEVIRI data.

- P5 title: Suggestion: Fog and low cloud “spatial” patterns

- P5L27: unfinished sentence

- P8 figure caption: “fls” should be in capitals.

- P8L8: Omit the “the” at the end of the line.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1268>, 2018.

C4