

This study presents the detailed synoptic-scale meteorological conditions, on the daily and weekly scale, during the three deployment months of the ORACLES field campaign over the southeastern Atlantic. The key meteorological factors associated with the low-level cloud fraction are interpreted, with the goal of supporting the future process-orientated study on the aerosol-stratocumulus interactions. The results and analyses are solid and sound. Without major concerns, I do have minor comments and suggestions listed below, which should be considered and addressed, before the potential publication.

General Comment:

This study presents and describes the meteorological conditions thoroughly with multiple figures and tables and concludes with interesting results. However, with the plentiful recent observational studies of MBL stratocumulus and aerosol-cloud interactions over the southeast Atlantic published on the ACP special issue (https://acp.copernicus.org/articles/special_issue978.html), this paper will benefit from a discussion where the results are put into context of the previous studies (e.g., what is the implication of the unusual-to-climatology meteorological conditions presented here on the aerosol-cloud interactions; or certain discussions on how the future study would better disentangle the meteorological factors from the aerosol-induced cloud-adjustment based on these results). I will leave this to the author for consideration.

Minor Comments:

P5 L124. Fig. 1a is not showing the grid box clearly. Perhaps it would be better to reference Fig. 1b or 1c.

P6 L133. Is there a reference for the threshold?

P6 L143. Please state the spatial resolution of the product.

P7 L189. Please define ER-2 and P-3 prior to the abbreviation.

P10 L208. Do you mean Figs. 2(a, b)? Also, if you are trying to convey the strong association between AEJ-S, RH, and the heat low, why not overlay the wind contours on all Figs. 2abc for better illustration?

P10 L211. Do you mean Figs. 2(a, b, f)?

P12 L227. ‘...flight days (Figs. 3a & 3b’, and ‘...targeted flight on 24 September 2016 (Fig. 3c)’

P12 L230. Please be consistent with the units and avoid using the non-SI unit.

P12 L239. Shouldn't it be Fig. 3h for 20160914?

P14 L256. It should be either ‘weakly’ or ‘insignificantly’.

P14 L259. I am a bit confused here. In Fig. 3jkl, the high concentrations of 600 hPa BC (region A) sit on the 600 hPa high wind-vector (by the previous definition, that would be the AEJ-S), while here states the BC did not reach the AEJ-S altitude. Please clarify the discrepancy between the messages shown in Fig. 3jkl and Fig. 4a.

P14 L261. Sounds conflicting with the previous discussion that the subsidence facilitates the entrainment of the near-BL-top BC. Are you suggesting that the entrained BC have fully interacted with the cloud droplet?

P14 L265. If region A has similar features as B, why separate them? Some prior discussion on the particular interests (or importance) in choosing regions A and B might help readers interpret the elaborated analyses here.

P16 L275-280. The skew-T charts in Fig. 5 (especially b & c) show much dryer layers (~900 – 700 hPa) sitting between the stratocumulus and the 600 hPa moisture layers, while the dry convection pushing up the moisture above 700 hPa, looks like the moisture (and BC?) advected aloft did not sufficiently propagate downward. How does it impact the BC entrainment discussion?

Is 600 hPa presented here the most typical BC transportation level? Did the aircraft pick up any signal of the BC vertical redistributing?

P18 L313-314. Please be cautious about the causality implied here, perhaps adding a few references to support it.

P18 L320. Remove ‘...for this region’?

P18 L325. Do you have an associated analysis in (10° W–0, 5 – 15° S) to support the statement? It seems odd to bring up a non-aforementioned region when you are comparing regions A and B.

P23 L372. Besides the coordination with the CLARIFY, is there any other particular reason for choosing the flight 20170818? As it did not reach to A or B regions and did not show the AEJ-S or LLJ-related meteorological conditions along the flight track.

P29 L452. Any possible explanation for the switch-signed correlation between the low-CF and BLH?

P41 L620. Wouldn't the stronger subsidence associate with higher LTS, and hence higher low-CF?

Figure 3j. What are the A and B boxes?

Figure 4d. The black solid line is rather gray. Perhaps change to the black color or change the thickness of the line.

Figure 6a. The A and B boxes are not matching the lat-long descriptions.

Figure S3d. What is the meaning of the shaded area?

Joint PDFs (e.g., in Fig. 6, 11, 16; S3, S5, S7). ‘Pearson's r ’.