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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The invigoration of deep convective clouds over the Atlantic: aerosol effect, meteorology or retrieval artifact?" *by* I. Koren et al.

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Reviewer #1 (Dr. F.-M. Bréon)

C: This paper discusses the correlation between atmospheric aerosol load and various cloud parameters. It is a subject of high importance as the interaction between aerosol and clouds is one of the main uncertainties regarding the anthropogenic impact on climate. I am very much impressed by the overall quality of this paper. It contains an excellent review of the recent literature on the subject; it does provide new methods and results, the method is clear and its conclusion are adequately presented. There is no doubt that it must be published as is or with very minor changes.

A: We thank the Dr. Bréon for his kind remarks.

C: P 3911: I believe that the delta-pressure that are found correspond to larger delta height than the values indicated in the text.

A: The delta-pressure – delta-height values have been corrected

C: There is an extra comma on line 19 of page 3905

A: The extra comma has been removed

C: Caption of Figure 2: Should mention that the aerosol product depicted is at the 1 degree scale.

A: In the caption to Fig. 2 (now Fig. 3) we have indicated the 1-degree scale

C: Figure 4e and 4f. It would be somewhat better if the plot indicated the range of AOD for which the cloud top pressure is averaged (with an horizontal bar for instance).

A: We tried such presentation before and eventually decided not to add the horizontal aerosol ranges on the figures because we felt that it would detract from the clarity.

C: Also applies to Fig 5 and 6 Figure 7: I am surprised the results are so much different at the 1 degree resolution and the others for the geopotential height and temperature parameters as this parameter is expected to vary smoothly.

A: Regarding the resolution changes effect to the geopotential height and temperature fields in GDAS, we agree. Indeed such analysis indicates that the 1 degree resolution of these variables holds significant spatial information.

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