

## ***Interactive comment on “February 2017 extreme Saharan dust outbreak in the Iberian Peninsula: from lidar-derived optical properties to evaluation of forecast models” by Alfonso J. Fernández et al.***

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It would be beneficial to include some sort of backwards trajectory analyses for each of the sites at different altitudes during the dust event. Back-trajectories during the period of study are now presented, as suggested, and the related discussion introduced in the manuscript (lines 358-373). In many circumstances the written tense is incorrect. Unless a description of a process is ongoing or is general, past tense should be used. The majority of circumstances when something "is" done or somethings "are" done should be replaced with "was" or "were". Similarly, there are many instances when "the" is not used before a noun. I have indicated this where possible but this should be

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double checked. This has been double checked and corrected Some more specificity about the performance of the models (at least the NMMB model) should be included in the abstract. Currently there is just a comment saying that the NMMB/BSC-Dust shows a better agreement with the observations than the BSCDREAM8b model but the reader does not get a sense of the overall performance of each and therefore the abstract does not state whether either of these could be viable in forecasting dust outbreaks in the future. New results have been included Furthermore, the discussion and/or the conclusion should make future recommendations based on model evaluation done in this study. Would you recommend the NMMB/BSC-Dust model to be used for future forecasts? Should both be used still? Is further evaluation still required? Further evaluation is still required An indication of how this dust event differs from normal conditions or other dust events (in terms of magnitude and frequency) would be useful. Supplementary data has been included. These data which indicates how this dust event differs from normal conditions are explained in lines 92-98. Technical corrections: Line 66. "Actually" is not needed. Corrected Line 77. Are you saying that the high uncertainty degree in aerosol radiative forcing estimates is result of the temporal and spatial variability in dust, or in aerosols in general? In aerosols in general, as it is written. Dust contributes to that. Lines 125-134. A short sentence stating what pristine or typical AOD values within the region should be given to give a sense of how intense a value of >2 actually is. These data have included in the supplementary data referenced in lines 92-98 Line 156. It should be "The AErosol and RObotic NETwork (AERONET)..." Corrected Line 175. Also point the reader to Figure 2 where they are shown on a map. Done Line 216. This sentence doesn't make sense. As a consequence, the next two sentences are very confusing. Changed Line 356. RCS should be defined here. Done Line 365. "... so a especial attention will be paid to this period.." should be "so special attention has been paid to this period". Done Lines 400 - 407. There are 4 circumstances of a missing "the" in these lines. "studies period" (Line 400); "lidar ratio" (Line 401); "Lidar ratio" (Line 404); and "particle and volume" (Line 407. Corrected Fig.6 "LR" should be written as "Lidar

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ratio" to be consistent with the other x-axes. Done Line 437. "were found certainly low" sounds awkward. Changed Line 441. "that it produced" OK! Line 444. Include the citation. Done Line 446. "22Feb" format is inconsistent with previous notation. Changed, now it is consistent Line 479. "low altitudes" is more appropriate than "low atmospheric levels". Changed Line 502. "the Barcelona site" OK! Line 508. These two 30-minute periods are "more representative" of what? A clarification is included now. Line 514. "Comprehends" is not the correct word here. Changed by spans Line 538. what is the "previous one"? It has been specified Line 582. Indicate that fractional bias will be "FB" Done Line 647. Indicate that you are referring to Figure 13. Done Line 649. I'm not familiar with the use of "nervousness" in a scientific context although I could be wrong. Line 665. "spreader" should be "are more spread". And it should be Fig 14 rather than 13. Done Line 677. Define CoM earlier or just say "center of mass" Done Line 688. Explain why "too long aerosol lifetime in the upper layers" is a possible cause. Further explanation about meteorology has been included Line 699 and Line 702. "allows us" or "allows the evaluation of" Line 747 - 751. Done This sentence is too long. Break it into smaller sentences. Done Line 802 "for instance in Granada" is awkward at the end of the sentence Changed

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2018-370/acp-2018-370-AC3-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-370>, 2018.

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