

Interactive comment on “Dust aerosol impact on North Africa climate: a GCM investigation of aerosol-cloud-radiation interactions using A-Train satellite data” by Y. Gu et al.

Anonymous Referee #1

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This work attempts a rare combined investigation of aerosol direct, semi-direct and indirect effects by performing an offline and a full GCM investigation. I recommend its publication after addressing the following points.

1. The empirical expression for the effective diameter reported in Jiang et al (2011) is used to characterize the relationship of effective diameter to AOD and convective index CONV. My guess this AOD cannot be totally attributed to dust particles. So, the title seems somewhat misleading.
2. Only the effective diameter expression for the North Africa is used. This seems OK with the offline investigation; however, it poses problems in the full GCM investigation

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due to potential regional interactions. I suggest performing another experiment using all the empirical expressions for different regions and comparing the results.

3. The authors perform both offline and GCM investigations, but provide little comparative discussion between the two sets of studies. A paragraph to discuss the similarities and differences will definitely enhance the paper.
4. Minor comments: 1) P31404 and L16: delete “aerosols” 2) The last paragraph between L10 in P31415 and L 10 in P31416 fits better as the introduction of Section 4.

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