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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Development and testing of a desert dust module in a regional climate model" *by* A. S. Zakey et al.

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Thanks for your comment !

1 : Wet scavenging. In the literature, the range of assumption for scavenging efficiencies of dust particle is wide, and the level of scientific understating of underlying processes still poor . Some studies consider dust particle totally hydrophobic (as they might close to the sources) other studies assume a coating (sulfate, nitrate) for fine particle and a nucleation efficiency close to sulfate aerosol (e,g Chin et al., 2000 ; Zender et al., 2003; Grini et al., 2005, i.e a fraction assumed to be incorporated in cloud droplets between 0.7 and 1). Here we roughly estimated default parameters between these two hypothesis , giving more weight to the hydrophobic hypothesis as we were focusing on a zone relative close to the sources. In any case this scavenging efficiency decrease with dust size bins . The issue of dust wet deposition should be definitely

explored more carefully through constraint with observational data and sensitivity studies.

2 : Optical properties : As most of the comments outline the lack of homogeneity between the emission distribution and the assumption of a long range mode for O.P calculation, we now have considered (in the model and in the revised version to be submitted) the log normal emission distribution (3 mode given in the manuscript) to perform Mie Calculation and determine the optical parameters : so now, the median diameter and the standard deviation are fixed and consistent between emission and optical properties, however we still had to make assumption on the relative amplitudes attached to each mode (varying with soil types and wind conditions), as we tried to explain in the reply to F.Dulac.

3 : Screening of MISR data: We plan to process daily L3 MISR data rather than using the monthly averaged to filter the model output. If delay appears to be too long and according the editor decision, we plan to include the pixel count L3 Monthly information to discuss area of uncertainties in the satellite retrieval.

4 : AERONET AOD in Cape Verde will be included and compared to the model output.

5: Figures quality will be improved in the revised version.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 1749, 2006.