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

Anonymous Referee #2

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This paper is interesting in modeling on African dust outbreak, particularly with calculations of dust optical properties within a regional climate model. However, the comparisons of dust emission, concentration and AOD should be presented with the surface dust measurements and the previous publication about Saharan Dust to better validate the coupled RegCM-dust model.

In the dust emission scheme of the paper, it is considered that the main mechanism for dust emission is controlled by two factors: (1) surface wind speed and (2) soil surface properties. It is better to give brief information of RegCM-modeling on wind speed and soil surface properties (e.g. soil moisture).

How is the 3 mode dust emission distribution represented by discrete" 12 emission sub-bins"? Please inform the size-ranges of 12 sub-bins. Dust aerosol particles distribute in the large bins. Why are the source magnitude for first dust bin (small bin? sub-bin?) displayed for the period of 13-16 March 1998 in Fig. 2?

The soil aggregate size distribution parameters in table 1 are same with Table 2 of Gong' et al. (Gong, S.L., X.Y. Zhang, T.L. Zhao, I.G. McKendry, D.A. Jaffe, and N.M. Lu, Characterization Of Soil Dust Distributions In China And Its Transport During ACE-ASIA 2. Model Simulation and Validation, Journal of Geophysical Research, 4262,doi:10.1029/2002JD002633, 2003), whose soil size distributions were derived from Chinese soil measurements. If table 1 is after Gong et al., are these parameters reasonable for African soil?

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