

## ***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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**AOD computation:** To compute extinction coefficients, you assume a given 1-mode aerosol size distribution which is very different from the 3-modes size distribution of emitted particles. That might affect the model simulation of the aerosol optical depth (AOD), especially close to source regions where AODs are the highest and will therefore have the most radiative impact. You might also compute extinction coefficients with an emission-type of dust size distribution to assess the possible effect of your assumption.

**Model-satellite comparison:** As seen in MODIS and TOMS daily images, many satellite data are missing due to clouds or viewing limitations, which is one severe limitation of

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satellite products. One consequence is that satellite AODs correspond only to clear-sky situations. The seasonal average of model results should take into account such a limitation for the satellite comparisons. Following Schulz et al. (JGR 103, 10579-10592, 1998) I recommend that a specific product is build from the RegCM AODs, averaging only those daily data which have a coincident observation by the considered satellite. It would be further possible to make a more quantitative evaluation of the model by plotting a point by point correlation between the model and the satellite results for all model grid boxes in an appropriate latitude band for dust (see also Schulz et al.).

Satellite products: Why using only MISR data for the seasonal comparison when TOMS and MODIS are used for case studies? Is not MISR available for the SHADE case? What about MODIS for JJA 2000? The accuracy of the satellite AODs used would be welcome.

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