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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Numerical simulation of "An American Haboob"" *by* A. Vukovic et al.

Anonymous Referee #3

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General comments:

This manuscript describes high resolution numerical simulation of mobilization of dust due to high velocity surface winds produced by strong convective storm and severe downbursts and comparing results with both remote and in situ observations. Successful numerical modeling small-scale patterns within dust storm is very challenging task. Selected dust model NMME-DREAM (a regional coupled atmospheric-dust model), on high horizontal resolution, is managed to produce an accurate shape, duration and magnitude of the dust storm.

Three components of dust model are important: successful simulation of weather event, parameterization of the dust cycle and definition of the mask of potentially dust productive areas. Since the NMME-DREAM model is already well tested on coarser resolution, over large desert regions, the major focus in this paper is on specification

of dust sources through mapping of the areas that are dust productive under favorable weather conditions. According to the obtained modeled dust concentration at surface which is several times less than observed, three major sources of uncertainty are emerges: *dust-related parameterization *better definition of the mask of potentially productive areas *the observations themselves where particles of different origin was included but not simulated in this setup of DREAM Sensitivity of surface concentration of PM10 (Figure 10) on different masks shows how important dust source mapping is.

Scientific value of this paper, which aim is to describe small scale processes within "haboobs", consists in directing attention toward further investigation not only dust source mapping but also parameterization of dust related processes on high resolution as well as further improvement of observations.

The paper seems to lack citation of newer work from this field.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 26175, 2013.