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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Density currents as a desert dust mobilization mechanism" *by* S. Solomos et al.

Anonymous Referee #4

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The paper focuses on a specific type of density currents in Western Sahara that are associated with intensive generation of dust and initialization of meso-scale dust storms. These phenomena are of relatively small scale and are not resolved in up-to-date GCM, CTM, and even most of RCM studies. Therefore it is very important to quantify their effect and eventually parameterize it in large-scale simulations. The authors have chosen for their case-study a series of convective storms over Atlas Mountains on May 31, 2006. The authors also reported the sensitivity of the simulated dust generation to the model resolution. The paper is well written and can be published after minor revision.

General Comments

1. Paper considers dust as a trasor and does not discuss a radiative effect of dust 2. This kind of hampers comparison simulated dust with observations

3. The considered density flow develops after the rain. It would useful to discuss how this could effect dust generation efficiency

Specific comments

L. 124: Remove "phase"

L. 140-145: I doubt the parent domain uses two-way boundary conditions. If yes, please clarify

L. 213: Remove "."

L. 222: Change "formatted" to "formed"

L. 264: Change "extend" to "extent"

L. 266-270: Units for flux are incorrect

L. 370: 20% of CCN is of course exaggeration but it is strange it did not have an effect

L. 372: For the shallow convection in subtropics ice nucleation is not applicable

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 21579, 2012.