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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 #1

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This manuscript presents an analysis of the simulation of density currents giving rise to dust emissions using the RAMS/CLAMS model. The work is well written and the topic is relevant in the context of dust modeling in desert areas.

My main concerns are:

1) The analysis presented in this work heavily focuses on the model results and no explicit comparison is made with observations. The authors only mention at the end of page 21590 the meteorological observations presented in Knippertz et al 2007. However, a comparison of the observed variables at the stations mentioned in the paper need to be included. In addition, I would recommend the incorporation of a new section describing the observations. Moreover, based only on model results the authors make quantitative assessments of the system behavior that cannot be contrasted with any

ground truth.

2) Only one case is analyzed. The in-depth description of the case study is interesting but it raises the question on how representative is this case when compared with the eight density current systems observed during SAMUM.

3) Are you explicitly considering the effect of the rain that is produced by these storms on the soil properties, so inhibition of dust emissions might occur right after the passage of the leading edge of the storm? If not, you are over predicting the dust emissions. This issue needs to be explicitly addressed in the manuscript.

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