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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A new convective cloud field model based on principles of self-organisation" *by* F. J. Nober and H. F. Graf

Anonymous Referee #2

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General comments:

This paper proposes a new model to represent atmospheric surface driven convection. The novelty of the model is that it not only treats the interaction between clouds and the environment, but also incorporates cloud-cloud interactions. This is achieved using an equation that is more commonly used by mathematical population biologists to study the interactions between different species. The model is then incorporated into a global circulation model and compares favorably with a large-eddy simulation of shallow convection.

Specifics:

While the manuscript presents an interesting new concept, I find that the paper is short on details. Specifically, how are the values of the interaction matrix determined, and

what range of values is obtained? How does this influence the spectrum of cloud sizes? Given that this is a novel concept, the readers should be allowed to become more familiar with some of the nuances and diagnostics. The linearization of the matrix deserves more analysis, and I would encourage the authors to focus upon some of these aspects in future work.

I also found the comparison with the large-eddy simulation (LES) and the existing GCM parameterization to be inadequate at providing real validation. I expect that the good agreement with the LES could have been achieved simply by tuning the model's free parameters (of which there are several). The authors should compare the climatology from the existing and new schemes. Does the model improve the tropical cloud cover, etc? There are good observational diagnostics available to test this (e.g. ISCCP). How does the scheme do in the tropics. I expect (and hope) that this will be examined in future studies.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 3669, 2004.

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Interactive Comment