**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Regional modelling of tracer transport by tropical convection – Part 2: Sensitivity to model resolutions" *by* J. Arteta et al.

Anonymous Referee #1

Received and published: 27 April 2009

The paper shares many of the same positive and negative attributes with the first paper of the series. Testing convective parameterizations against aircraft and satellite measurements in real time is a worthy objective. The paper also has some interesting remarks on the effects of changes in spatial resolution on tracer transport and vertical velocities.

However, the comparisons between the model and the measurements are almost entirely qualitative. There are few objective statistical tests of the models against the measurements, either on a climatological basis (monthly averages) or on shorter timescales, other than with the Manus radiosondes. There is no unique way to devise a skill score for rainfall. However, it would have been very interesting to have been given one in the paper, and to see the degree to which higher spatial resolution improves

rainfall predictability, or not.

The paper has some discussion of the biases between the models and measurements: e.g. modeled temperatures in the tropopause region are too warm and modeled temperatures in the troposphere too warm. However, there is no attempt to determine the origin of these biases, so the reader is left wondering if the biases are general features of these convective parameterizations, or are peculiar to the model setup.

I would also recommend that both papers be reviewed by a native English speaker. One reason would be to tighten up the grammar: the article "the" is often used inappropriately, "convection parameterization" rather than "convective parameterization" (convection is a noun, convective an adjective), odd use of plural ("convective and stratiform precipitations"), etc. But more importantly, the text contains a number of long sentences, in which the meaning of the sentence becomes progressively obscure. This undermines the readability of the paper. There are many examples but the sentence from line 11 to 17 stretches over seven lines. If an author wants their paper to have an impact in the scientific community, they should write papers with clear, short, direct sentences. And if their first language is not English, the sentences should be especially short. Extensive, and at times unnecessary, use of acronyms also tends to undermine the readability of the text.

I also think the paper could be shortened with a greater focus on the key conclusions, and less repetition.

Other Issues:

- mismatch between text and caption for Figure 4

- caption 6: what is a "volumic tracer"?

- Table 3: how was the bias calculated? Between individual Manus soundings and the model, or between monthly means?