

## ***Interactive comment on “Global anthropogenic aerosol effects on convective clouds in ECHAM5-HAM” by U. Lohmann***

### **Anonymous Referee #2**

Received and published: 20 November 2007

This manuscript describes the results of global aerosol effect on convective clouds using two-moments microphysics of convective clouds. This is an extension to previous paper of two-moments microphysics for stratiform clouds. The paper is generally well written and the topic suits the subjects of ACP. Improved results have been obtained using the new treatment of the convective clouds. I recommend the manuscript be published after revision. The comments are as follows.

1. L21-23, P14640: Albedo is a ratio, but here its unit is  $W m^{-2}$ , which must be the unit of radiation. 2. L8-9, P14641: The supercooled drops can be simulated not only because the drops were small and numerous, but also because the ice crystal sizes are below  $100 \mu m$  (so the collision efficiencies between ice crystals and drops  $< 10 \mu m$  are close to zero) and graupel particles of  $100-200 \mu m$  cannot collect drops  $< 10 \mu m$ . 3. L6,

Interactive  
Comment

P14646: "resp." is an abbreviation. The whole word should be used. 4. L8, P14648: "...the changes described above". This is mis-signposted. The description is on the next page. 5. L8, P14648: "It requires an enhancement of the autoconversion and aggregation rates...". The author discussed the enhancement of the autoconversion in L6, P14649. What is the increase in aggregation rate? 6. L6, P14649: "In order to bring balance back into equilibrium, the autoconversion rate in stratiform clouds is enhanced by 60%...". Is there any previous theoretic, observational, or modeling support for this magnitude of enhancement? The results obtained in this manuscript are directly linked to the enhancement (along with the enhancement in aggregation rate). If there is no solid background for this enhancement, the author must state the uncertainties due to this treatment in the conclusion section. 7. L20, P14649: It is better to use storm track than "stormtrack". Same in L6, P14650. 8. L12-3, P14651: "...peaks between 100 and 300 hPa". It is between 200 and 300 hPa. 9. L20, P14652: "Fig. 6d". Which is Fig. 6d? 10. L2, P14653: "This maybe" should be changed to "This may be". 11. L14, P14654: "the 20th" should be changed to "the 20th century". 12. L14-15, P14655: "the wet scavenging has not vastly changed" What is the reason since the autoconversion rate increases by 60%?

---

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14639, 2007.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)