

***Interactive comment on “Sensitivity of aerosol concentrations and cloud properties to nucleation and secondary organic distribution in ECHAM5-HAM global circulation model” by R. Makkonen et al.***

**R. Makkonen et al.**

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We thank the reviewer for the suggestions and comments. Please see also author's comment "general comment".

Presented values for aerosol concentrations were obtained by first calculating median aerosol distribution and then CN10 and CN100 from this distribution. Komppula et al. (2003) reported mean values instead. We have recalculated values to be more comparable to other reported values: CN10 and CN100 are now calculated for each time step and median value is calculated over one year of these values. However, we still report median and not mean values.

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It is true that in many locations, rather similar results could be produced by increasing primary emissions. In our paper we conclude that overestimation of nucleation rates could be due to underestimation of primary particle emissions. If we would increase primary emissions, the modeled nucleation rates would be smaller. We have rephrased our conclusions taking this into account.

We have now included satellite data in the paper to make comparison easier, and figure text was rewritten. Text was modified to include also discussions about differences between model and observation.

#### References:

Komppula, M., Lihavainen, H., Hatakka, J., Paatero, J., Aalto, P., Kulmala, M., and Viisanen, Y.: Observations of new particle formation and size distributions at two different heights and surroundings in subarctic area in northern Finland, *J. Geophys. Res.*, 108(D9), 4295, doi:10.1029/2002JD002939, 2003.

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Interactive comment on *Atmos. Chem. Phys. Discuss.*, 8, 10955, 2008.

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