

Interactive comment on “Conceptual study on nucleation burst evolution in the convective boundary layer – Part III: Physico-chemical characterization” by O. Hellmuth

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1. General remarks to referee 1 and 3 (RC1, RC3)

I would like to thank both referees very much for the time they took to scrutinise the text! For the reasons given in response to part I, the title will be changed as follows: **Columnar modelling of nucleation burst evolution in the convective boundary layer - First results from a feasibility study. Part III: Preliminary results on physico-chemical model performance using two 'clean-air mass' test scenarios**

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2. Response to specific comments of RC1

1. RC1: –

AC: Page 11518, line 7; The old sentence

"Based on the previous CBL simulation, two conceptual scenarios of the evolution of ultrafine condensation nuclei (UCN) in an anthropogenically influenced CBL are investigated."

will be changed as follows:

"Based on the previous CBL simulation, a feasibility study is performed using two 'clean-air mass' scenarios with an emission source at the ground. Such scenarios synoptically correspond to the advection of fresh postfrontal air in an anthropogenically influenced region. The aim is to evaluate the time-height evolution of ultrafine condensation nuclei (UCN), and to elucidate the interactions between meteorological and physico-chemical variables in a PBL column."

2. RC1: Page 11520, line 4; "within"

AC: To be corrected in the final version. Thanks.

3. RC1: Page 11520, Fig. 2; How can Aitken and accumulation mode concentrations be that low in anthropogenically influenced CBL?

AC: The referee is kindly referred to my response to part I and to response to RC3 for part III. In part I, a new section 5 has been inserted.

4. RC1: Page 11524, line 6; "molecules"

AC: To be corrected in the final version. Thanks.

5. RC1: Page 11525, UCN size range in nanometers

AC: As only mass and number concentration are predictive variables, the UCN size range is diagnostically determined, but not evaluated. It results from number and mass concentration. At the initial state, the radii are $r_{1,0} = 1 \times 10^{-9}$ m for the

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UCN mode, $r_{2,0} = 10 \times 10^{-9}$ m for the Aitken mode, $r_{3,0} = 100 \times 10^{-9}$ m for the accumulation mode.

6. RC1: Page 11530, line 6; "later on"
AC: To be corrected in the final version. Thanks.
7. RC1: Fig. 10a; Colour of graph
AC: Excuse me. To be changed in the final version. Thanks.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 11517, 2005.

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