

## ***Interactive comment on “The comprehensive model system COSMO-ART – radiative impact of aerosol on the state of the atmosphere on the regional scale” by B. Vogel et al.***

**B. Vogel et al.**

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We thank the reviewer for his valuable comments and suggestions. We followed each of them in our revised version of the manuscript.

1. The abstract should present more clearly the result you found on the 'aerosol feedback' as in  $W/m^2$  and/or as temperature change (the difference of the R and the F simulations).

We followed the reviewer.

2. Throughout the manuscript, the use of the term 'aerosol density' should be 'aerosol

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concentration', if in deed you mean concentration.

We changed it.

3. For section 2.1, you should add why there are two mode (i and j) for each type (f and c). What is the differences, e.g. mean diameter of the modes?

We added an explanation and give the numbers.

4. For section 2.1, it is unclear which modes the primary particle emissions, e.g. primary sulfate, primary organics, would go into – or simply not accounted for.

We added an explanation.

5. In equation (14) and (15), please check if the subscript for the coagulation term should be of soot (s), not sulfate.

We corrected.

6. Section 2.5.1, please clarify more about emisisions of PM10, PM2.5, and PM1 – when these are emitted, C3459 what compositions do these emissions have, e.g. sulfate, organics.

We explain it in more detail.

7. Section 2.5.2, please do subscript for  $D_p$  (diameter).

We corrected.

8. Section 3.1 (page 14501 line 3), the point about using clean air at the boundaries of your model seems to weaken the validity of your simulation. Can you substantiate why there is no better alternative, e.g. using more realistic information?

We explain it in more detail.

9. Page 14505 LIne 23, the point about emissions being constant from day to day should be stated clearly in the Emissions section.

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We added a sentence in the emissions section to explain it.

10. page 14486 Line2, the sentence 'online coupled means that only one grid and identical physical parameterizations are used' – can you put it differently. This is not very clear.

We explain it in more detail.

11. page 14488 line 22, please give reference for the parameterisation of the binary nucleation scheme used here.

We added the reference.

12. page 14488 line 23, can you give a few words or 1-sentence description rather than reader have to go read Schell 2001?

We explain it in more detail.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 14483, 2009.