

Abstract

Ln 14ff: Highlight main reason for underestimation of the total BC concentration?

Ln 20f: what means 'contribute to AOD'? Use different expression.

General: mention the difficulties of the model in reproducing the wet season for both meteorological and chemical processes

1. Introduction

P. 7310

24f: structure, meaning of the sentence?

P. 7311

5: originate from

P. 7312

3: indirect instead of semi-direct

18ff: structure of paragraph explaining the health related aspects? Seems some information are doubled.

22: "Some empirical studies suggest..."

P. 7313

7-12: sentence too long

15: leave out 'specifically'

21: complicated structure of sentence

25: define 'near-source'

2. Model and model simulations

P. 7314

13: is interpolated

16: modeled temperature

P.7315

11: data set combines different...

27: biogenic emissions are not calculated online

P. 7316

6f: Modeled time period ranges from Aug 26 to Dec 31 2010.

23f: define the term 'co-emitted species' and their role

P. 7317

4ff: Clearly describe the differences between S1 and S2.

24: end sentence after used ()...

26: leave out 'in particular'

P.7318:

General: what qualifies the measurement stations being suitable for model evaluation, especially with regard to the coarse model resolution; in what way are they representative for the area? Further discuss the imbalance of number of stations for the eastern and the western part of the domain as presented in Fig. 1.

Chapter 3 Comparison with observations and reanalysis data

7319

9: better: daily weather pattern

15: ITCZ is moving southwards

General:

- Maybe it is better to use r^2 as it includes the variation as well. Your values would be even smaller then.
- Discuss the problems of GPCP precipitation data

7322

27: not correlated

7324

6: better: wind speed is overestimated when coming from western direction

23: explain: 'two times the SD...'

7325

19: at this point it should be mentioned that the differences in inversion layer heights might be important for the simulation of the turbulent structure of the atmospheric boundary layer which might in turn influence the vertical mixing and thus is supposed to increase the near surface concentration of BC.

22: near-surface BC: which layer, height in the model?

7326

8ff: can a higher atmospheric stability be the cause of generally higher concentrations of BC in September?

18: on which basis have the PDFs been calculated? What is the reason of the tail towards the higher values of the PDF calculated from the model?

7327

1ff: meaning of the sentence; see comment above

26: can you prove the overestimation of wet deposition from model results?

7328:

23: define 'equivalent location'

27: see above, leave out 'somewhat'

7329

5ff: can be mentioned earlier

7330

15: what then?

7331:

23f: wrong size distribution: can you state this from the results?

7332:

2: leave out 'somewhat high'

Chapter 3.4: Can you give statements about daily cycles of NO_x etc., how are these species linked together? Mainly ozone and NO_x are closely linked via the photochemical cycle. High concentrations of NO might also be related to an underestimation of vertical mixing.

7333:

7: Model fails to reproduce meteorological as well as chemical conditions in December

11: enhanced wet deposition?

17: might be important to mention the lack of observation data in the western part of the domain at this point. Therefore it is difficult to draw conclusions for the domain model mean

7335:

1ff: Does figure show monthly mean value? Which month?

7336

4.2.1. Where is PM₁₀ and PM_{2.5} in this discussion?

7337

4.2.2. Maybe indicate in the image which grid cells are significant within the confidence level? Do the figures show interpolated or pixel values?

7338:

Chapter 4.3: Shorten the chapter and include substantial findings into chapter 4.2 (combine 4.2.1 and 4.2.2)

5. Conclusions

Mention, that the model has substantial problems in reproducing the meteorological and chemical conditions in December. Is it a general problem of the model to deal with precipitation with these settings or is it only a problem with the modeling time period?

7340

13: surface dimming? New aspect which has not been mentioned before

General:

- Highlight the key outcome; refer to the title of the paper.
- Are there future plans?
- Consider parametrization of urban areas within future studies, which might change results especially for urban areas and surroundings.

Figures and Tables

Table 1: Add: Size of domain, land surface model, modeling time period

Figure 2: fairly small, add more information to the subtitles

Figure 4: add height in m NN

Figure 5: add more information that the figure can be understand as standalone

Figure 6b: more information about shown PDF (data base etc.)

Figure 8: more detailed subtitle

Figure 9 left: pixel values or interpolated? Consistency to the MODIS image

Figure 10: more details in subtitle

Figure 11: too small. What is shown here (time period) ?