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Comment

Interactive comment on “A numerical study of the contribution to the air pollutant in Beijing during CAREBeijing-2006” by Q. Z. Wu et al.

Anonymous Referee #2

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This is a very interesting study of the influence of local and regional emissions in and around Beijing. Through tagging source emissions in different counties their contribution to Beijing is quantified in a regional model simulation. The model results are evaluated with observations in the region.

Some details of the analysis and model evaluation are not clear. The authors need to be much more explicit and clear about which model levels and measurement altitudes they are using.

The paper is appropriate for ACP and I recommend publication after addressing my comments below and improving the English.

Specific comments:

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p.5275, line 13-17: I do not understand this sentence. Provide a more complete explanation of what you did.

p. 5276: I disagree that 'The Supplements provides more details on the tagged method'. The supplement does show 2 nice animations of a tag and how it evolves with time. I think a little more description of the tagging is needed. Tagging SO2 and PM10 is straightforward. Is NO2 emitted directly and those emissions tagged? Or is NO emitted and then NO2 formed? How is O3 tagged? This is the sort of information I expected in the Supplement. I think it would also be appropriate in Section 2.2.

Section 2.3. Explain what sort of revising was done to the Streets inventory.

p.5278, line 17: What are 'Layer-2' and 'Layer-3'?

p.5281: Give more explanation about 'the upper layer'. Why was this altitude picked? 'the upper layer' is not a very explanatory label for this, and confusing. Isn't it still within the boundary layer. Throughout the paper I would use 'at 1 km' instead of 'at the upper layer'.

p.5286, line 8: I don't understand how the analysis shown was 'separating pollutant transport layers'. Either this sentence should be rewritten to say that you looked at the surface and at 1 km, or the earlier discussion should say how the 'separating' was done.

Grammar:

Abstract: Line 12: Define 'upper layer'

Line 14: Country -> County ?

Introduction, line 27: 'in-deep' -> 'in depth'

p.5273, line 9: challenge-> challenging

line 10: applied the CMAQ model

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p.5275, line 6: 'p-vertical' -> pressure ?

line 9: 'performed to' -> 'performed for'

lines 11-12: the tense of this sentence makes it confusing

p.5276, line 2: 'produce' -> 'production'

line 7: the jth grid is outside

line 10-11: rewrite start of sentence: Compared to a sensitivity analysis where emissions from one region or source are switched off, ...

line 21: resting -> remaining

line 22: emissions (spelling)

p.5278, line 14: rewrite: 'illustrating properly'

line 22: what do you mean by 'simulated out'? rewrite this here, and other places.

p.5279, line 25: rewrite: 'in linkage'

p.5280, line 6: 'entry-ways' -> 'pathways' (also other places in paper)

line 11: what do you mean by 'accumulation/extinction processes' ?

line 13: 'there was clear evidence'

line 20: 'but with less amount' -> 'but with less' or 'but with lower amounts'

p.5281, line 19: estimation of the contributions

line 20: with a contribution

p.5282, line 4: except in Pinggu (or except from?)

line 5: significantly -> significant

line 17-19: rewrite sentence – tense is wrong, meaning not clear

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line 23: particle matters -> particulate matter

p.5283, line 9: 'pollution in Beijing was dominated'

line 16: 'tracer gases' -> 'trace gases', and what do you mean by 'more transportable'? having a longer lifetime? Are transported greater distances?

p. 5284, line 13-17: This sentence is hard to follow.

p.5285, line 28: 'was' -> 'is'

p.5286, line 5: '22 tagged emissions regions'

Fig. 2 caption: should be 'red shading indicates urban areas'. {could be 'stands for' instead of 'indicates'}. Please say what other colors mean.

Fig. 3: explain 'Layer-2' and 'Layer-3' in the caption.

Fig 6: explain 'upper layer' in the caption. 'the grey bars ...' should be the start of a new sentence: 'The black bars and numbers in each county indicate the fraction of SO₂ in Beijing that comes from that county.'

Fig. 8 (11): say same as Fig 6 except for PM₁₀ (NO₂).

Fig. 13: say upper left/right, lower left/right instead of up and down. What altitude are these plots?

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 5271, 2011.

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