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Atmospheric Chemistry and Physics Discussions

Interactive comment on "TransCom continuous experiment: comparison of ^{222}Rn transport at hourly time scales at three stations in Germany" *by* S. Taguchi et al.

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Summary of proposed revisions to address reviews

The authors would like to thank the reviewer for the valuable comments that have improved the manuscript. Please find below a point by point answer to the comments. <The answers are displayed in italics.>

Specific comments:

Section 1, page 19258: You mentioned the radon flux map by Szegvary et al. (2007) is spatially and temporally resolved. Did Szegvary et al. (2007) or others apply this map

in the 222Rn transport simulation? I wonder if the temporal variability in exhalation rate at Freiburg and Heidelberg could change the seasonal cycle of simulated 222Rn concentration significantly. Can this data be used to estimate the uncertainty related to local exhalation rate in this work?

Flux map of 2006 in Szegvary was applied in transport simulation using TM5 and the results for FRB are shown at

http://radon.unibas.ch/index.phpoption=com_content&task=view&id=30&Itemid=58

We might use a flux map of Szegravy (2009) in the figure. Until then, it's difficult to comment on what impact this would have on seasonality. The Szegvary 2009 paper (not 2007 paper) shows little flux seasonality for the latitude or longitude band which includes these German sites and the figure on the web-site only has observed FRB for half of 2006, and we don't know whether any of the corrections we've applied to FRB have been used in this test. Szegvary et al. (2009) will be cited in the revised manuscript.

Section 2.1, first and second paragraph (page 19259-19260): In my opinion, this part could be moved to appendix. First, the data correction used here may be useful for other related studies and can be cited as appendix directly. Second, it will make this section more readable for general readers or modelers not familiar with measurement technique.

We will move the second and the third paragraph into Appendix.

Section 4.4, page 19266, line 1: Please define "NSD".

NSD will be defined in Sect. 4.3

Section 4.6, page 19269, line 25: You analyzed the relationship between normalized seasonal mean concentration and PBL-height diurnal amplitude at Heidelberg. Have you made the same analysis for Freiburg and Schauinsland? Will the relationship at

Freiburg be different from that is observed at Heidelberg?

Absolute value of correlations at Freiburg is lower than those in Heidelberg while the sign of correlations is the same in each season. Schauinsland correlation are also weaker than those for Heidelberg, with the winter correlation being close to zero rather than positive. The table below contains various measures in two years (2002-2003). The MAX-MIN corresponds to vertical axis in Figure 8. We added following sentences: "Analysis for Freiburg also gives a positive correlation for winter and negative in other months though the correlations are slightly weaker than for Heidelberg. Schauinsland gives close to zero correlation for winter and negative correlations in other seasons."

FREIBURG						
	MEAN	STD	MIN	MAX	MAX-MIN	H H<300
DJF	0.075	0.415	0.009	0.162	0.355	0.126
MAM	-0.486	-0.457	-0.192	-0.551	-0.641	0.607
JJA	-0.759	-0.647	-0.250	-0.828	-0.858	0.849
SON	-0.265	-0.093	-0.150	-0.324	-0.360	0.433
HEIDELBERG						
	MEAN	STD	MIN	MAX	MAX-MIN	H H<300
DJF	0.034	0.432	-0.064	0.124	0.407	0.181
MAM	-0.622	-0.611	-0.298	-0.742	-0.805	0.716
JJA	-0.805	-0.709	-0.433	-0.853	-0.881	0.850
SON	-0.307	-0.150	-0.160	-0.359	-0.394	0.485
SCHAUINSLAND						
	MEAN	STD	MIN	MAX	MAX-MIN	H H<300
DJF	-0.250	-0.183	-0.267	-0.232	-0.025	0.270
MAM	-0.570	-0.656	-0.441	-0.617	-0.600	0.484
JJA	-0.751	-0.710	-0.453	-0.710	-0.676	0.646
SON	-0.389	-0.266	-0.349	-0.365	-0.263	0.399

Technical corrections

Page 19258, line 10,14,15: Please use either s^{-1} or sec^{-1}, but not both

s^{-1} *is used.*

Page 19285, caption of Fig.5, line 1: add (N.S.D.) after normalized standard deviation, as it appears in the figure.

added

Page 19286, caption of Fig.6, line 4: Measured should be Simulated

– *This comment was withdrawn by the reviewer.*

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 19253, 2011.