**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.

**S. Taguchi et al.**

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## General comments

The authors would like to thank the reviewer(#3) 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 minor suggestions for the authors –**

Section 2.1, page 19260, line 15: I can't follow the equation for the corrected Freiburg values.

*The description is moved to the Appendix. A regression equation between Heidelberg monitor and Freiburg monitor was incorrect. It was corrected in the Appendix and an evidence is shown in Fig.S1. Now you may follow the equation, namely FRB_new=(0.8FRB_old-0.23)/0.704.*

Section 2.2, page 19262, line 3-5: I am interested in the BLH comparison between radiosonde and ECMWF. Which method did you use to determine the BLH from the radiosonde observations? Why did you think there is no evidence of inconsistency between observations and ECMWF?

*We defined BLH_radiosonde as the altitude where potential temperature matches with that at the surface when the lowest layer is in an unstable condition as demonstrated in Fig.S2. Temporal variations of the estimated BLH are shown in Fig.S3. BLH in the ECMWF regional model data set are sampled when the radiosonde observations estimated BLH with horizontal interpolation from 0.5 resolution data. The altitude of BLH estimated from radio sonde and regional model are compared in Fig.S4. Geographical distributions of the stations are shown in Fig.S5. We modified sentences as below: "To assess the diagnosed BLH in the ECMWF dataset, we also estimated BLH from radiosonde observations available in the neighborhood (Nancy, Hanau, Stuttgart, Sigmaringen), defining the BLH as the height at which potential temperature is the same as the surface when the lowest layer is unstable. We found reasonable correlation between the radiosonde and ECMWF BLHs except at Sigmaringen which had relatively few radiosondes available in 2002-2003."*

Section 3, page 19262, line 19-22: The reported BLH from 14 models may be determined from different algorithm. Do you think this will have any impacts on your comparison results?

*It is difficult to determine how much differences in the definition of BLH in different models could impact our results. We now note this issue in our discussion of Fig.3. "The method used to define BLH in each model may also contribute to the differences*

*from the ECMWF derived BLH." In respect of Fig.8, it is possible that since we compare against MAX-MIN BLH, i.e. amplitude, then this may reduce some of the impact of differences in BLH definitions.*

4.Section 4.3, page 19266, line 1: Please define NSD.

*defined*

Figure S1. Results of intercomparison conducted at Freiburg in August of 2002.

Figure S2. BLH was estimated when the lowest layer is in an unstable condition. It was defined as the altitude where potential temperature is the same as that at the surface.

Figure S3. BLH estimated from radiosonde (IGRA) data in 2002 and 2003.

Figure S4. BLH estimated from IGRA data set and ECMWF Forecast.

Figure S5. IGRA stations used in this study.

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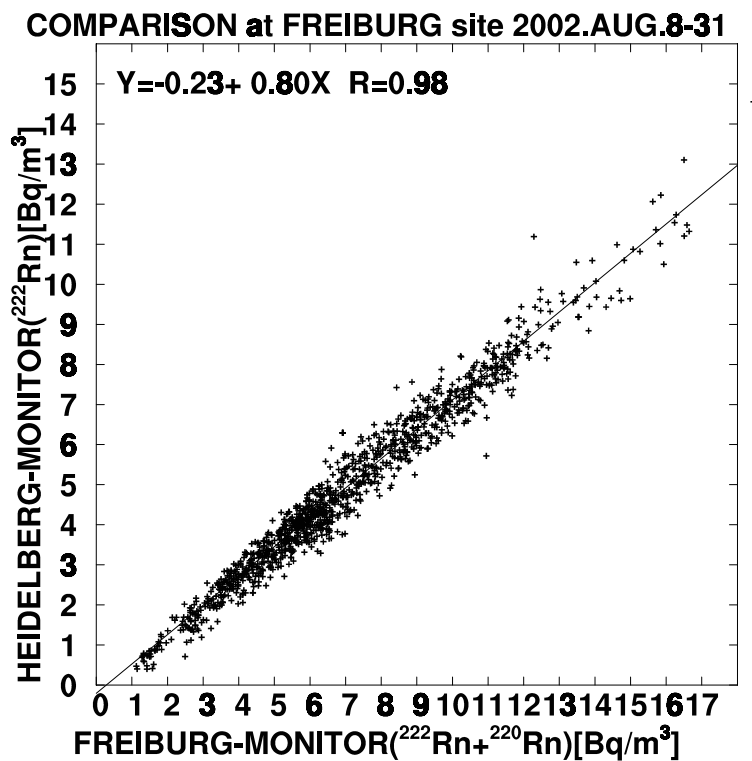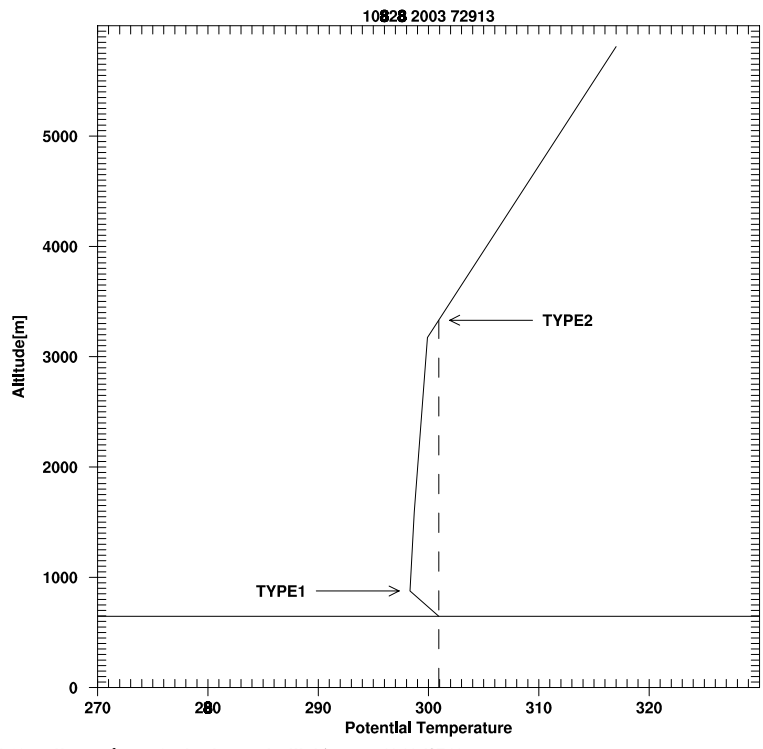Interactive comment on Atmos. Chem. Phys. Discuss., 11, 19253, 2011.

**Fig. 1.** Results of intercomparison conducted at Freiburg in August of 2002.

**Fig. 2.** BLH was estimated when the lowest layer is in an unstable condition. It was defined as the altitude where potential temperature is the same as that at the surface.

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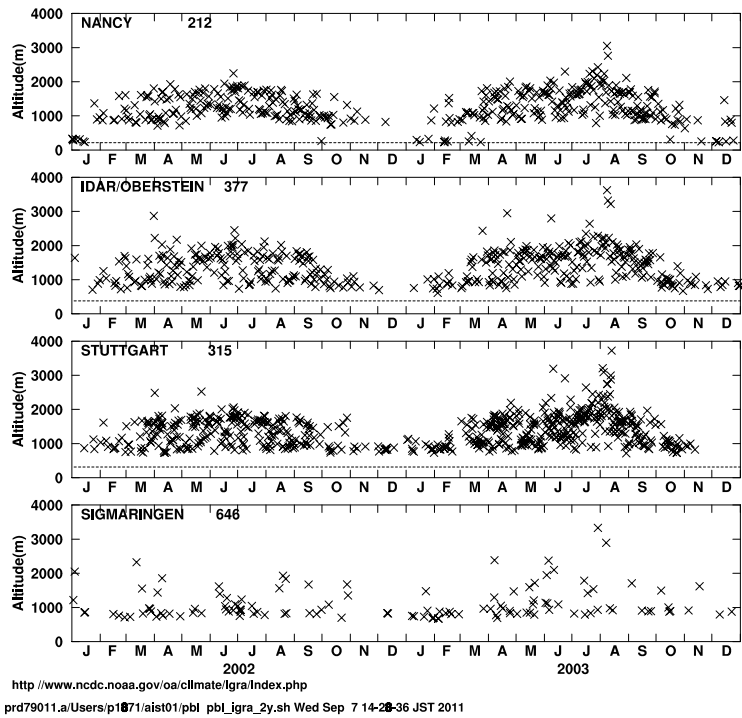


**Fig. 3.** BLH estimated from radiosonde (IGRA) data in 2002 and 2003.

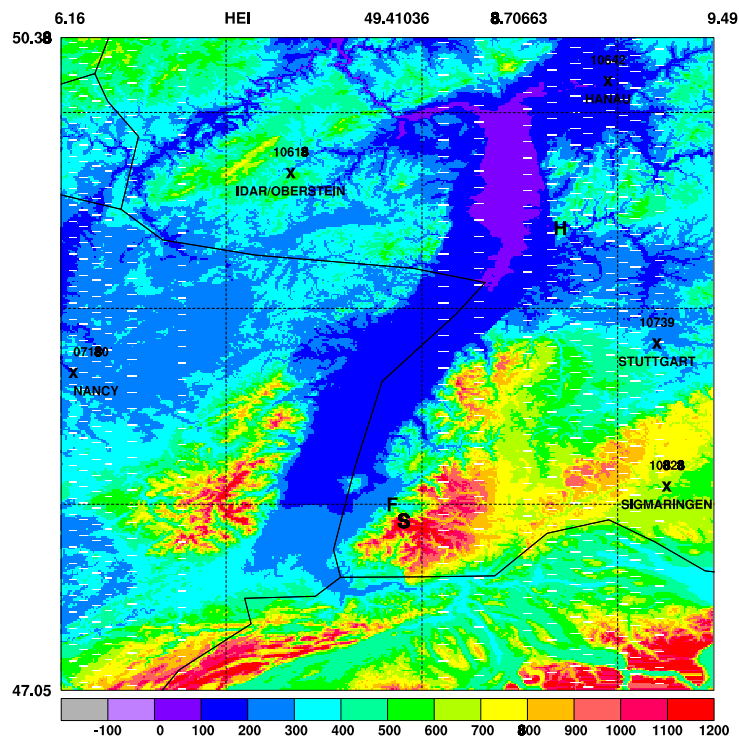C9178
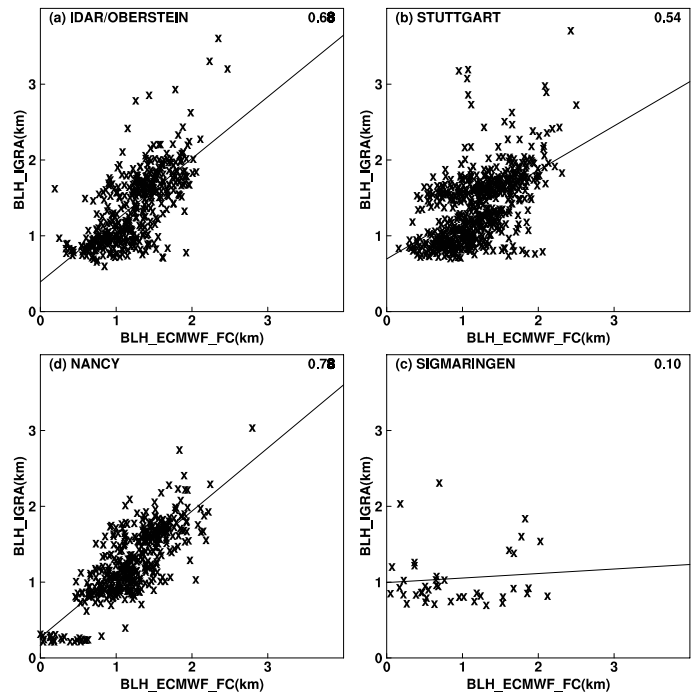
**Fig. 4.** BLH estimated from IGRA data set and ECMWF Forecast.

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**Fig. 5.** GRA stations used in this study.