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Atmospheric Measurement Techniques Discussions

Interactive comment on "Use of portable FTIR spectrometers for detecting greenhouse gas emissions of the megacity Berlin – Part 2: Observed time series of $X\mathrm{CO_2}$ and $X\mathrm{CH_4}$" *by* F. Hase et al.

Anonymous Referee #2

Received and published: 18 June 2015

General Comments

This manuscript is the second of a two-part series describing the deployment of a suite of five portable FTIR spectrometers for measuring XCO2 and XCH4 around Berlin. The first manuscript ("paper #1") describes the characterization and calibration of the instruments, while the second presents the data acquired during a campaign that took place in June and July 2014, including comparisons with a simple dispersion model to quantify the CO2 source strength in Berlin. The use of multiple spectrometers in this

way provides a new tool for assessing local-scale emissions of greenhouse gases. The work should be of interest to both the measurement and modelling communities.

The manuscript is generally well written and I recommend publication. However, I agree with the other reviewer and with the two reviewers of paper #1 that the two manuscripts should be combined. There are frequent statements in this manuscript referring the reader to "the first part of this work" so that it does not stand on its own. In addition, each paper on its own is rather thin on results; combining the two would give a stronger publication, eliminate duplication, and ensure that the reader does not have to refer to another paper for relevant information. The detailed reorganization of the two manuscripts into one suggested by the other reviewer seems logical.

Technical Corrections

Page 2768, lines 2 and 14 – define FTIR in the Abstract and again in the text

Page 2768, line 3 – here and elsewhere in the text, add a hyphen in column-averaged (this is inconsistent throughout the manuscript)

Page 2786, line 15 – holds great promise

Page 2768, line 21 – space-based

Page 2769, line 14 – form

Page 2770, line 1 – delete "during"

Page 2770, line 3 – knot is not an SI unit – is it accepted by AMT? why not use m/s?

Page 2770, line 7 – delete "A"

Page 2770, line 11 – southeast of the city center

Page 2770, line 13 – delete "originally" ?

Page 2770, line 14 – up to five

Page 2770, line 25 – change “it could be shown earlier” to “it has been shown previously”

Page 2771, lines 13, 15 and elsewhere – change to “on the order of”

Page 2771, line 22 – an . . . bias (not biases)

Page 2771, line 24 – the observed bias is comprised of

Page 2773, line 6 – sites,

Page 2773, lines 8 and 21 – five (not 5, e.g. four used in line 9)

Page 2773, line 15 – information

Page 2774, line 2 – replace molecules with particles

Page 2776, line 12 – it’s ambiguous what is delayed – state explicitly (the model ?)

Page 2777, line 1 – define MACC

Page 2777, line 2 – complex structureS . . . are

Page 2777, line 6 – sources ?

Page 2777, line 11 – column-averaged

Page 2777, line 22 – kernel

Page 2778, line 2 – column-averaged

Page 2781, Table 1 – Column 2 is hard to read: break it up into five vertically aligned subcolumns. Define the symbols used for quality in column 3.

Page 2782, Table 2 – State what the % contribution is for.

Figures 2, 3, 4 should be combined into a single figure with three panels in the combined manuscript.

Similarly, Figures 6, 7, 8 should be combined into a single figure with three panels in the combined manuscript.

Page 2791, Figure 9 – Indicate the location of Berlin on this map.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 2767, 2015.