

## Review: Establishing Long-term Measurements of Halocarbons at Taunus Observatory

### Overview:

This manuscript was an interesting read and a thoughtfully put-together paper that adds something of value to this current field of research. It outlines a newly-established regular whole air sample measurement time series based in Germany and highlights some of the current and potential uses for this dataset with several “case study” compounds. Overall I have very few suggestions to make with respect to improving the manuscript. I have outlined these below.

### General comments:

- The use of “bi-weekly” is unclear as it can mean twice a week or once a fortnight (<https://en.oxforddictionaries.com/definition/biweekly>). Please clarify, at least at first use.
- I understand the focus on a select number of compounds for brevity but I feel that as an introductory paper more could be said in the introduction (e.g. p.3, lines 3-15) or Section 2.1 about the flask sampling programme to advertise it to others. A purpose of academic publications being the advertisement of available data for collaborations. I would suggest including (either here or in a supplement) a full list of compounds measured from the whole air samples; any ancillary measurements (e.g. pressure, temperature, wind speed) and a small description of the site: e.g. is it an existing met site with long-term measurements also taking place? If there is a website that could also be given.

### Minor comments:

- P.1, line 3: I feel “allows to assess” (p.1, l3) should be “allows us to assess”.
- P.3, line 28-30: does sampling always take place on the same day or at the same time? Does sampling ever occur on weekends? This may be of interest to future data users. For example there may be a difference between weekday/weekend emissions for some compounds.
- P.4, lines 2-3: please give the timeline between sample collection and analysis? What is the longest samples are stored for? What is the average storage time?
- P5, line 7: “Table 1” not “table 1”.
- P5, line 9: You mention a “target standard” here but do not elaborate on this until the next page. It would be worth at least saying something along the lines of “discussed in...” here as I was left at this point thinking ‘what is a target standard?’.
- Figure 2: An inset legend with visual identifies would be useful (and I believe to the ACP standard), compared to descriptions in the legend. This is also the case in Fig. 8. I also can’t see a dashed line.
- P8, line 17→ and Fig. 3: Can the poorer correlation for CFC-11 be explained?
- Fig. 3: Can colours not be used as in other figures? E.g. there are colours to distinguish TOF and QP in Fig. 7.
- Table 2: I suggest this table is moved earlier in the manuscript, perhaps linked to when the compounds are introduced.
- P.11, line 15: Can increases of 0.1 ppt be determined based on the sampling frequency and analytical uncertainties?

- P.12, line 17: Do you mean “**Fig. 6(b)**”?
- I would suggest investigating other colour schemes for Fig. 11, if it needs colours at all. The green and red are not colour-blind safe and there is an intensity disparity between the yellow and grey and the blue.
- P.18: “Outliers of HFC-245fa occur most often in correlation with an undefined trajectory origin” – what is your explanation for this? Would it perhaps be better to say something along the lines of “No clear sector of origin is seen for HFC-245fa”?
- P.19, lines 1-7 (and other parts in this section): Can we say more about sources? Location of industry in these regions?
- P.19, lines 13-17: Can you provide some idea for a “why” for this section? Why does it occur most often when air comes from the this sector?
- Section 4 (Conclusions): Is there potential for this dataset to be used for emission inventory work in the future? If so perhaps touch on this.
- P.20, line 23: The sentence starting “An exception to this represents CFC-12” is rather clumsy and I recommend rewording.
- Earlier (p.17, line 21→) you mention that conclusions drawn from the trajectory analysis should be “handled with care” (due to low sample numbers and trajectory uncertainties) so I suggest repeating some of this uncertainty in the conclusion where your trajectory results seem to be stated as certain.