Response to referee 2 https://doi.org/10.5194/amt-2022-67-RC2

We thank the reviewer for the comprehensive comments on our manuscript. Below we give our detailed response to each of the comments (shown in italics) and the changes or additions made to the manuscript based on them.

Broadly, the subject reported in the manuscript is interesting and may have practical applications within the environmental field, particularly in air quality management. The description of the suggested concept could develop better to offer an easier comprehension to potential non-expert readers.

We clarified the concept at several points. We have reiterated that this concept is for a set of common tools to be used by stations for currently not harmonized workflows.

We added sentence to introduction: "Developing documented workflows for situations not covered by large-scale network protocols is a problem many stations need to solve."

We removed the phrase: "and what larger scale infrastructures the station belongs to," from *chapter two.*

*We added a sentence: "*In general, any computer that supports container virtualization and has enough storage can work as the server."

This is to highlight that we are talking about station scale solutions here.

We added a sentence to conclusions: "This makes it useful for measurements not controlled by the centralized solutions."

In addition to change in abstract below.

Several Figures should be improved to facilitate understanding.

We removed Figure 6 as unnecessary. We revised Figure 1, 3 and 4 captions for clarity.

The English editing should be notably enhanced./ The English editing should be notably improved.

Some excessively long sentences were split into several sentences. Many word choices were revised to simpler alternatives. Unnecessary words were removed from several places.

Comments from supplement:

Abstract: It is adequate; nevertheless, the authors should highlight why the differences with other infrastructures are important within the conceptual frame and not just mention them.

We added sentences to abstract:

"Secondly, by providing tools for making data interoperable in general instead of harmonizing a particular set of instruments"

"As such it is not meant as a replacement for these infrastructures, but to bring structured data analysis to more measurements not covered by them."

1. Introduction: The authors follow a common thread that is easy to follow. They correctly pose the conceptual problem within data processing in air quality networks and provide an overview to potential readers on reasonably similar current structures.

The comment requires no action.

Comment on the phrase: 'To effectively operate and expand a network of atmospheric stations, the observations need to be harmonized and supported by coherent data and document management'. The observations or measurements recorded by air quality networks should be tested or validated but not harmonized. The measurement techniques used for monitoring air quality status should be harmonized to offer traceability of monitored air pollutants data.

We removed the loaded word harmonized. Supporting measurements with data workflows was the point of the sentence.

Figure 1 is explained in section 3, making it challenging to understand at first glance. The authors should provide information concerning Figure 1 in section 2.1.1.

We reference Figure 1 and explain the workflow already in section 2.1. In section 2.1.1 we refer to parts of the workflow in an example manner. We explain the colored categorizations are explained in section 3. The figure serves several purposes, only one of which is relevant at a time in each chapter.

We added text: "The different colored hashed boxes indicate which implementation part of SMEARcore is involved in each processing step. The implementation parts are explained in Section 3." *to the caption.*

We added text: "Section 3 explains how the various parts are implemented in SMEARcore." *into section 2.1.1.*

We added a sentence: "The black bordered boxes are steps in the workflow." *to the caption.*

Figure 3. The legend should be finished.

The "Par..." in the legend is simply the interface cutting off the phrase "Particle number concentration", since that column has been resized smaller than the text. It's not ideal, but this is what it looks like in normal use which is what is being demonstrated by the figure. The meaning of the colorscale (which we assume is what is meant by legend here) and the y-axis is explained in the figure caption.

It would be of interest whether the authors could establish a cost-benefit relation between the centralized solutions such as ICOS or ACTRIS stations and the new conceptual framework.

This would require considerable extra research and as such is not feasible in the scope of this article.