

In this manuscript, long-term datasets on heavy metals at different monitoring sites in the Czech Republic are investigated. Dispersion normalized dataset obtained by the application of ventilation coefficients to correct for variations in meteorological conditions was studied and compared with the original dataset. In support of grouping of individual sites and data interpretation, non-parametric statistical tests were applied to describe trends in heavy metal concentrations and correlations between the elements and different sites.

While the selected dataset and methodology are appropriate, the manuscript should be improved for clarity before publication.

GENERAL COMMENTS

Although I didn't find many major language issues that would significantly hinder scientific understanding, the manuscript would strongly benefit from thorough language editing (especially the results section).

The manuscript also requires some stylistic edits:

- Introduce abbreviations at their first mentioning. Afterwards, use them throughout the manuscript and do not explain again (except in captions). For instance, abbreviations for different locations are introduced in L123-125 – do not explain them again in L170-180; OR and DN are not explained when first mentioned in L180, instead they are explained later on in L245, which is not needed; abbreviations of individual monitoring sites are only explained in SI and not in the main manuscript (maybe include them in Fig. 2?)
- Figure and table captions should be self-explainable, which needs to be improved. Bear in mind that one should understand figures/tables without reading the manuscript. For instance, it is not clear from the caption what circles in Figure 4 mean. Moreover, avoid using abbreviations in figure and table captions (or explain them for clarity).
- Proof edit literature citations throughout the text (e.g. L98, L193).

I suggest to introduce OR and DN abbreviations early in the manuscript (in the methods section). I further suggest using these abbreviations also to distinguish between the two datasets (e.g. L235 HM_{DN} and HM_{OR} datasets).

Figs. 5-8: in the discussion the authors refer to these figures and emphasize specific years for which data normalization was especially important. However, it is hard to read the discussion and search for details in the figures at the same time. Therefore, I suggest the authors specifically mark the cases they refer to in these figures.

Was VC calculated on a yearly basis?

SPECIFIC REMARKS

Is it possible that dispersion normalization skewed original data in the case of strongly episodic/non-continuous emissions?

For example, refer to L263-264: *As_{OR}–As_{DN} range: 7–47% probably reflected not only episodic emission events but also changes in meteorological influences...*

While industrial emissions are presumably episodic, the correction averages meteorological

conditions over long time periods, including time frames without significant emissions. Can you comment on that?

L23: *Once released into the atmosphere, HMs can be absorbed onto aerosol particles...*

HMs are typically released as particles and do not attach to particles after their release.

Moreover, *absorbed onto* -> *adsorbed on*. Please clarify.

L61: especially for traffic sites, very important source of Pb is also road dust resuspension, still containing large amounts of Pb due to historical use of leaded gasoline

L175: *...As concentrations were elevated at BU and T station types.*

Isn't BS (0.79 ng/m³) also higher than BRM/BRL (0.35 and 0.54 ng/m³)? Please clarify.

L232: *The individual HM concentrations trend analyses confirmed that the data series from individual stations are suitable for group calculations and further evaluation.*

Can you explain why?

254: *... confirms the effectiveness of legislative measures targeting As emissions.*

Can you support with concrete examples?

L265: *In those cases, the added value of the DN method is visible.* -> where can I see this?

L321: add main findings about dispersion conditions here or move to methodology. Please also explain what very good, good, slightly unfavorable, unfavorable refer to.

MINOR COMMENTS

L26: Dot missing at the end of the paragraph

L29> LRTAP -> CLRTAP (as further used in L73)

L40: *... we focused on these three sub-objectives in our study:* -> rewrite (objectives only follow down below)

L44: delete *investigate*

L63: from -> for

L73: what is CIEP and CHMI? In Table 1 and Figure 1 captions, CEIP is used together with a different year in the brackets. Please clarify what these abbreviations stand for. Moreover, explain NFR in Figure 1 caption.

98: introduce new paragraph starting with *The character of MLH...*

Figure 2: explain legend (ASL)

L125: en dash is missing in *Industrial station I* -> *Industrial station – I*

L161: explain HM_{DN}

L175: *... Ni concentrations at traffic station differed from those recorded at BU and BS locations. Ni at T station differed from BU and BS.* -> repeating

L227: BMR -> BRM?

L332: permanent -> constant

L341: *local and regionally transported ?pollution?*

L395: start new paragraph with *The ventilation coefficient...*

L400: start new paragraph with *The only location of all observed stations...*

L426: metallurgical and processes -> needs correction

L439: rewrite *Three factors demonstrated specifications of mountain locations...*