

Interactive comment on “Field and laboratory evaluation of a high time resolution x-ray fluorescence instrument for determining the elemental composition of ambient aerosols” by Anja H. Tremper et al.

Anonymous Referee #2

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The paper refers to a very important issue in the characterization of an aerosol sampling/analyzing device, namely, its analytical accuracy. Therefore, the work is relevant. There is a careful design of the methods used to validate the quantitative results. They are carefully explained and presented. It is remarkable that several analytical techniques are used to carry out the comparisons. I could find no scientific errors or misleading discussions. The conclusions actually point out to the results obtained in the text. Also, proposals to extend (and improve) the results are given. In short, I consider the paper should be accepted for publication. Nevertheless, I would like to suggest

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a few (minor) corrections and additions. 1. In section 2.1, I recommend adding a few lines mentioning the x-ray source and its operating conditions employed, as well as the detector type and characteristics (resolution, in particular). This may help the reader to better understand the results given in this manuscript. Also, the software and atomic databases used to analyze the x-ray spectra. 2. The aforementioned information might be useful to understand several of the apparently incorrect results, like the As overestimation. For instance, the As Kalpha x-ray peak overlaps the Pb Lalpha peak. Therefore, it is very important to carefully integrate and correct both peaks using the corresponding beta lines. This may be the reason of the extremely high overestimation in the measured As concentrations. Although it is not explained in depth, Se is another element with possible problems in quantification (see Fig. S7). 3. The plots in Figs. 2 and 6 need a larger lettering to facilitate reading. Moreover, instead of using thousands of nanograms, possibly using micrograms is easier. 4. Only as minor but important corrections in writing style, expressions like the one given in page 6, line 13, “75-650 nm” must be written as “75 nm to 650 nm,” according to the International System style rules (please, read the official document in the IBPM web site). This must be corrected in all the manuscript. Similar changes must be made when writing quantities (like those in page 6, lines 35 and 38), where a space between the numerical value and unit symbol is missing. 5. Also referring to the official document of the SI, the units “ppb” must be avoided, because of the different meaning of “billion” in diverse countries and languages.

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