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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Urban source term estimation for mercury using a boundary-layer budget method" *by* Basil Denzler et al.

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Referee comment in bold, reply in plain text.

A revised and highlighted version of the manuscript is available in the supplementary material.

The topic of the manuscript is relevant to this journal. The discussion and conclusions are based on the results obtained. There are some points to be revised before the acceptance of the manuscript.

The referee has recognized the relevance of this work for this journal and we readily address the issues raised to meet the referee's standards.

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Discussion paper

#1 Discussion on Hg(II) 3.3 Implications on emission reporting, Table 2 Please clarify whether the Swiss national CLRTP inventories for mercury emissions include only Hg(0) emissions or they include both Hg(0) and Hg(II) emissions. In the latter case, omission of Hg(II) in the boundary layer budget model needs to be discussed.

The Swiss national CLRTP inventories do encompass mercury and mercury compounds and as such also oxidized mercury species. The discussion and the introduction of the manuscript has, therefore, been revised accordingly. (page 9, line 25)

#2 Quantitative measures to evaluate the model fit Figure 3 C, Figure S6-S17 As to the comparison between the measured concentrations and the modelled concentrations, visual comparison of the graphs are used in figure 3C and figure S6-S17. However, it is not so easy to evaluate the goodness of the fit in a quantitative manner thorough the visual inspection. The reviewer recommends the authors to present some quantitative indicators that can be used to judge the goodness of the fit. For example, the RMSE used for the optimization might be presented along with the RMSE calculated for models with fixed BLH at 1500m (no inversion). The RMSE might be also useful for comparing basic scenarios and advanced scenarios.

The RMSE for the model fit have been added to table S2 in the supplementary material. We see this adjustment is a valuable contribution that further substantiates the decision made to focus on the basic scenario.

#3 Typos

#3-1: Table 1 and Table S1 The lower bound emission for 11/07/2015 is "38" g/hour, which seems too large and is not consistent with the mean lower bound emission of 2.8 g/hour.

The lower bound emission for 11/07/2015 have been corrected to the value of 3.8 g/hour.

#3-2: Page 4, line 16 "and validated model model" -> "and validated model"

Corrected

#3-3: Page 7, line 32 "the BLH ist the most sensitive" -> "the BLH is the most sensitive"

Corrected

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2018-402/acp-2018-402-AC2-supplement.pdf

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