

## ***Interactive comment on “First eddy covariance flux measurements of gaseous elemental mercury (Hg<sup>0</sup>) over a grassland” by Stefan Osterwalder et al.***

### **Anonymous Referee #2**

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This manuscript is very interesting and presented a very promising methodology significantly improved the Hg(0) flux measurement. Accurate measure Hg(0) flux has been a challenging issue over decades due to the limitations of available methods. As I read this paper, I had an impression that paper proposed a very promising trail work to significantly advance Hg(0) flux measurement. Overall, I support the publication of this manuscript on journal AMT.

Specific comments:

1. Line 14 to 15. The statistical estimate... (50% cut-off). Move this sentence to the present line 18. The field campaign based detection limit should be described in the

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context of the campaign.

2. Line 18, 24 in the abstract and throughout the manuscript (section 3.3), replace “re-emission” with “emission” in general. “Emission” represented the measured results better.

3. Line 176-181. Three auto-calibration strategies were performed through the course of field campaign. It seems that frequent auto calibration relaxed the baseline drifting (Fig.2d), and the authors do used same data processing steps to detrend the time-series data. So which measurement routine is better for achieving high quality data? Meanwhile, increased calibration frequency resulted a significant loss of online data, linear interpolation is mentioned to fill the gap before flux calculation: (1) will this increase the uncertainty compared to a less frequency of calibration, in terms of different proportion of high-frequency data gap filling? (2) the methodology of gap filling of high frequency data was not easy to understand in the present manuscript.

4. Line 439, replace dial flux cycle with diel flux pattern.

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