

Interactive comment on “Global Observations and Modeling of Atmosphere-Surface Exchange of Elemental Mercury – A Critical Review” by W. Zhu et al.

Anonymous Referee #2

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General Comments:

This paper is a thorough review of measurement and modeling studies of elemental mercury. The depth and extent of the analyses of available data does indeed make this a critical review rather than just a literature review. The discussion on the advances in the measurement techniques is beneficial. This paper provides a necessary addition to the scientific community's GEM literature and aids in furthering our understanding

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of the air-surface exchange of atmospheric mercury. With some minor editing on a technical scale, I recommend the publication of this paper in Atmospheric Chemistry and Physics.

I agree with Reviewer #1's comments regarding the paper by Agnan et al. (2015). The only discussion on their paper was relating to the measurement method. It would be interesting to see a discussion on the findings of the two papers and how they complement each other.

Specific Comments:

Line 108: Is this a possible typo that <1 Hz is considered a higher frequency?

Line 113: The use of “but” in this sentence suggests that the higher detection limit of 0.35 ng m^{-3} is a negative aspect but could that sensitivity be considered a benefit of this sensor over previous ones?

Lines 185-187: This sentence, while accurate, discusses the lack of the ability of this sensor at background sites. This study however was over Hg-enriched soils and the sensor performed well over Hg-enriched sites. Would it be useful to note this as an advantage to this method considering the high number of sites that are Hg-enriched?

Line 547: Perhaps consider mentioning why the fluxes would be higher in Europe than East Asia prior to 2002 and during summer and/or daytime.

Line 558: There are some studies that suggest the opposite (e.g. Lee et al., 2000; Fristche et al., 2008).

Lines 577; 593; 612; 627: The titles of the subsections in Section 4.4 include statements. Does this possibly change the flow of the paper?

Technical Corrections:

Please see separate file on technical corrections.

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