

## ***Interactive comment on “Soil emissions, soil air dynamics and model simulation of gaseous mercury in subtropical forest” by J. Zhou et al.***

**Anonymous Referee #2**

Received and published: 8 April 2019

Major comments- I find this paper poorly referenced, and basically, this paper provides no new information except for the fact the measurements were made in China. As I suggested in my initial review this paper is not suitable for an international journal such as ACP.

Line 63 please add Engle et al 1 regarding atmospheric ozone

Please remove the sentence that starts line 84 “This study is, to our knowledge.”

Do you have a research hypothesis that guided your work?

Line that starts 106 this is simply not true. Please do a full literature search.

Sentence line 160 –soil-air flux is also driven by processes occurring at the surface.

C1

Again the authors need to do a more complete literature search. A couple of examples include..2-5

It is not as simple as Fick's law.

For your gold trap analyses how did you do this and what was your analytical precision?

For your flux chamber please provide dimensions' turnover rate etc. in the main text.

For section 3.2 consider some references that provide the data and conclusions that are presented in Agan

Another reference to consider is 7

Pg 8 other references to consider include 8 and 2

I do not understand how you made the soil gas contour points when you were only making measurements at one location.

Please check significant figures throughout the paper.

Line 465 remember that just because there is a correlation it may not really mean anything.

Line 483. I think photoreduction of Hg(II) deposited to the soil is an important process that needs to be considered and you need to rethink this. Doing a more complete literature search may help you quantify this process. Try also looking at Eckley6, 9, 10

1. Engle, M. A.; Sexauer Gustin, M.; Lindberg, S. E.; Gertler, A. W.; Ariya, P. A., The influence of ozone on atmospheric emissions of gaseous elemental mercury and reactive gaseous mercury from substrates. *Atmospheric Environment* 2005, 39, (39), 7506-7517. 2. Zhang, H.; Lindberg, S. E.; Marsik, F. J.; Keeler, G. J., Mercury Air/Surface Exchange Kinetics of Background Soils of the Tahquamenon River Watershed in the Michigan Upper Peninsula. *Water, Air, & Soil Pollution* 2001, 126, (1), 151-169. 3. Zhang, H.; Lindberg, S. E.; Barnett, M. O.; Vette, A. F.; Gustin, M. S., Dynamic flux

C2

chamber measurement of gaseous mercury emission fluxes over soils. Part 1: simulation of gaseous mercury emissions from soils using a two-resistance exchange interface model. *Atmospheric Environment* 2002, 36, (5), 835-846. 4. Zhang, H.; Lindberg, S.; Gustin, M.; Xu, X. H., Toward a better understanding of mercury emissions from soils. *Biogeochemistry of Environmentally Important Trace Elements* 2003, 835, 246-261. 5. Briggs, C.; Gustin, M. S., Building upon the Conceptual Model for Soil Mercury Flux: Evidence of a Link Between Moisture Evaporation and Hg Evasion. *Water Air and Soil Pollution* 2013, 224, (10). 6. Eckley, C. S.; Gustin, M.; Miller, M. B.; Marsik, F., Nonpoint source Hg emissions from active industrial gold mines-2. Influential variables and annual emission estimates. In University of Nevada-Reno: Reno, p 13. 7. Johnson, D. W.; Benesch, J. A.; Gustin, M. S.; Schorran, D. S.; Lindberg, S. E.; Coleman, J. S., Experimental evidence against diffusion control of Hg evasion from soils. *Science of the Total Environment* 2003, 304, (1-3), 175-184. 8. Carpi, A.; Lindberg, S. E., Application of a Teflon (TM) dynamic flux chamber for quantifying soil mercury flux: Tests and results over background soil. *Atmospheric Environment* 1998, 32, (5), 873-882. 9. Eckley, C. S.; Gustin, M.; Marsik, F.; Miller, M. B., Measurement of surface mercury fluxes at active industrial gold mines in Nevada (USA). In University of Nevada-Reno: Reno, p 19. 10. Eckley, C. S.; Gustin, M.; Miller, M. B.; Marsik, F., Nonpoint source Hg emissions from active industrial gold mines-influential variables and annual emission estimates. In University of Nevada-Reno: Reno, p 14.

---

Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2019-161>, 2019.