

***Interactive comment on “Air–surface exchange of gaseous mercury over permafrost soil: an investigation at a high-altitude (4700 m a.s.l.) and remote site in the central Qinghai-Tibet Plateau” by Zhijia Ci et al.***

**Zhijia Ci et al.**

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Received and published: 10 November 2016

**We thank the reviewer for the insightful comments and valuable suggestions. We have incorporated the reviewer’s suggestions into the revised manuscript to improve the quality of our paper. Please find our point-by-point responses to the comments below in bold.**

The manuscript "Air-surface exchange of gaseous mercury over permafrost soil: an investigation at a high-altitude (4700 m a.s.l.) and remote site in the central Qinghai-

C1

Tibet Plateau" by Ci et al. brings important new information about air-surface exchange patterns and mechanisms in a very specific environment for which such information is missing in scientific literature. In the light of changing environment and future global Hg cycling, this information is of paramount importance.

General comments: In general, the manuscript is well structured, information properly presented and appropriate conclusions drawn. As such, I believe it merits the criteria to be published in ACP.

**Response: We appreciate the reviewer’s recognition of the merits of this work.**

Here are some specific suggestions that might help to improve and strengthen the clarity of this paper:

- Abstract: some numbers should be included in the abstract, e.g. about the magnitude of fluxes etc.

**Response: We have followed the reviewer’s suggestion to add the related data and numbers in the Abstract section.**

- Line 23: What is relatively long timescale? Try to be more specific.

**Response: The timescales have been added in the revised manuscript.**

- Line 31: What are favorable conditions? Perhaps first part of the sentence should be removed, as these conditions are discussed in detail later on.

**Response: We have followed the reviewer’s suggestion to remove “Under favorable conditions”.**

- Lines 93-108: This part is too general and should be significantly shortened or completely removed.

**Response: We have followed the reviewer’s suggestion to greatly shorten this part.**

- Line 144: Be more specific about soil plot/lithologic unit studied.

**Response: The details of soil property and related reference have been added in**

C2

**the revised manuscript.**

- Lines 235-241: This part is too general and should be shortened or moved to the Introduction.

**Response: We have followed the reviewer's suggestion to move this part to the Introduction section.**

- Lines 241-248: This part belongs to section 2.1

**Response: We have followed the reviewer's suggestion to move this part to Section 2.1.**

- Lines 270-283: This part belongs to the Method section.

**Response: Thank you for the constructive suggestion. A new sub-section (Section 2.3: Controlled field experiments) has been added into the Method section in the revised manuscript. We have moved the description of controlled field experiments about water addition and different waveband of solar radiation to Section 2.3.1 and 2.3.2, respectively.**

- Lines 452-453: What exactly you mean with "large uncertainties". Perhaps you should elaborate a bit more on this.

**Response: The sentence has been rewritten in the revised manuscript.**

Technical/linguistic comments:

- Line 227: Remove "in" before "below".

**Response: Done.**

- Line 254: I suggest replacing "Investigators supposed: : ." with "Previous studies: : ." or similar.

**Response: Done.**

-Lines 249-253: I suggest rephrasing and combining this information in one sentence.

**Response: Done.**

C3

-Line 445: Replace "improve" with "increase" or "enhance".

**Response: Done.**

Figure 1: scale should be included.

**Response: Done.**

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Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-515, 2016.

C4