

Interactive comment on “Insights from mercury stable isotopes on terrestrial – atmosphere exchange of Hg(0) in the Arctic tundra” by Martin Jiskra et al.

Anonymous Referee #1

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The reviewer's comments are appended as a PDF-file.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-225>, 2019.

C1

The manuscript is well written, exemplarily concise and of high scientific quality. One problem is, however, that the data presented already to some degree been published in Obrist et al. (2017) doi: 10.1038/nature22997.

The present manuscript refers to this Nature paper more than 20 times, which hampering a throughout reading obtaining comprehensive information from text, tables and figures.

A basic issue is that a summary tabulation of flux and ancillary data statistics (number of observations, flux data coverage (%), % of data rejected due undeveloped turbulence or fetch limitations etc. etc.) is missing in both papers. Please, provide a table in the main part or in a supplement.

The uncertainty in flux measurements is not mentioned and quantified. Such a discussion should also include that the flux derivation is obtained by asynchronous Hg0 sampling of the two heights.

The measured Hg0 deposition velocities should be mentioned and discussed with literature data.

Correlation analysis between measured gases, flux and environmental parameters is not presented.

To improve the readability, consider assigning the oxidation state of Hg in delta and capital delta notations (e.g. $\delta^{202}\text{Hg}$, $\Delta^{199}\text{Hg}$) when found appropriate.

Specific comments:

Page 2, Line 1	drawn down, consider revising
Page 2, Line 14 - 15	Lindberg et al. 1998 is outdated (suggesting foliage as net source of Hg ⁰). Consider e.g. Bash and Miller (AE, 2009) or Castro et al. (Atmosphere, 2016)
Page 3, Line 16	"1.5m apparat". mistake?
Page 4, Line 25	an aerodynamic... consider the aerodynamic...
Page 4, Line 29 - 30	On the universal temperature profile, provide a reference for the mathematical form used.
Page 5, Line 21	Provide \pm SD of the mean
Page 6, Line 10	... remained relatively low... try to be more concise (numbers)
Page 6, Line 16	ODE's without explanation. Define Ozone depletion events as ODEs.
Page 6, Line 22	Provide median also, if there is a substantial difference with mean

Fig. 1.

C2