We would like to thank for the comments and suggestions. We have addressed all comments below and have indicated the corresponding modifications in the revised version of the manuscript. The line numbers mentioned in our responses refer to those in the ACPD paper.

Anonymous Referee #2

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This study presents bi-directional fluxes of a number of POPs generated from gradient measurements made at a remote coastal site. Such data are needed for improving our understanding of the sources and fates of POPs over ocean surfaces, although the measurements could cover longer periods and for more POPs species with highvolume sampling. A box chemistry model is also used to explain the observed data and to improving the understanding of the air-surface exchange processes. The paper is generally well written and only some minor comments are provided below.

Line 211 and lines 182-185: Briefly explain if the insignificant gradients were caused by uncertainties in the measurement, or they represent the situation that fluxes were minimal.

Small fluxes cannot be distinguished from measurement uncertainties. The criterion to identify gradients is given in the text.

Line 391 and line 399: two contradictory statements. “0.0043 cm/s, significantly deviating from zero”, and “0.020 cm/s, not distinguishable from zero”.

Refers to the ranges spanned by a number of flux measurements specified in the text. These were 0.0043±0.0031 cm s^{-1} and 0.020±0.032 cm s^{-1}, respectively. The criterion to identify distinguishability is now identified in the text. The new text reads: “0.0043±0.0031 cm s^{-1}, still significantly deviating from zero (1 standard deviation criterion).” and “not distinguishable from zero e.g., 0.020±0.032 cm s^{-1} for α-HCH and 0.011±0.015 cm s^{-1} for PCB28 (1 standard deviation criterion).”

Lines 427-428: “wet deposition not significant” - because of small amount of precipitation, or particle size range?

Small amount of precipitation. Now specified.

Lines 439-440: delete the statement. Vd is sensitive to friction velocity (and wind speed) over any surface (see Zhang and He, 2014, ACP 14, 3729-3737).

Will be done

Line 449-450: should not compare a single size since any particle species covers a size range (i.e., a size distribution). A representative size does not mean it has a representative deposition velocity (see Ruijgrok et al., 1997, Tellus 47B 587-601).

Yes, thank you for pointing this out. As the difference between gaseous and particulate deposition fluxes (at the site during the measurements) was ≈3 orders of magnitude, the estimate made still leads to the same qualitative statement. This discussion will be correspondingly extended in the revised version. New text will read: “Furthermore, values of v_{dep} integrated over the entire size spectrum may differ considerably from values of v_{dep} for MMD (Ruijgrok et al., 1995). However, even then, particle deposition is unlikely to have significantly compensated for net-volatilization, as even for particles grown to 1.5 µm $F_{p\ dep}$ would be higher by not more than a factor of 10 (Slinn and Slinn, 1980).”

Ruijgrok, W., Davidson, C.I., and Nicholson, K.W.: Dry deposition of particles – implications and recommendations for mapping of deposition over Europe. Tellus B, 47, 587-601, 1995.

Same case for Line 463. Also 0.3 cm/s seems to be on the high end for submicron particles.

Yes, should account for more uncertainty. However and again, as the difference between gaseous and particulate deposition fluxes was ≈2 orders of magnitude in this case, the estimate made still leads to the same qualitative statement. The correspondingly modified text will read: "Hereby, v_{dep} = 0.05-0.3 cm s^{-1} was adopted to account for mass median diameters ranging 0.5-1.5 µm..."

Proofread the paper for fixing the editorial issues, e.g., Line 71 "to to"; line 73 "the highest"; line 458 "of for".
Will be done