

Interactive comment on “The distribution of methylated sulfur compounds, DMS and DMSP, in Canadian Subarctic and Arctic marine waters during summer, 2015” by Tereza Jarníková et al.

Anonymous Referee #3

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1. General Comments In this paper, authors measured the concentrations of DMS and DMSP in the surface seawater from the Labrador Sea to the Canadian Arctic Archipelago during the summer of 2015. In addition to the distributions of DMS/P concentrations with information of seawater parameters (hydrographic parameters, taxonomic compositions, and sea ice cover) in this area, they detected the abrupt increases in the DMS concentration at the front of hydrographic parameters by measurement with fine spatial resolution. The data obtained from this observation contributes to the accumulation of database in the Canadian Arctic waters and to discussion on the response of DMS to changes occurring in the Arctic Ocean. This paper would be acceptable if the authors reconsider and correct the part described in Specific Comments and

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2. Specific Comments

(1) Authors conclude that the results obtained from this cruise (shallow MLDs and mixed phytoplankton assemblages) support the results of previous studies by Gabric et al. (2004) and Levasseur (2013). I wonder whether the spatial changes such as the differences between the sea-ice free area and the locations where sea ice has just melted can be compared with the result caused by sea ice reduction in future Arctic waters.

(2) The authors discuss the sharp increase in DMS concentration obtained from the measurement of high spatial resolution. Then what happened where the DMS concentration sharply decreased for example at 2600km, 3600km, 4000km, and 7600km?

(3) L262: In Equation (1), do you need to include the DMS concentration in the surface atmosphere? When you use this equation, you need to mention about omitting this.

(4) L269: The exchange coefficient of the flux calculation is a function of the wind speed at the 10m height from the sea surface. Please note that the height of the anemometer. And if the height is far from 10m, then you need to mention about the influence of the height difference.

3. Technical Corrections

(1) When reading bg-2017-337.pdf, I found the following typing mistakes. I think that there are other typing mistakes in this draft, so reread and fix them.

(2) About the use of "Figure" and "Fig", if "Figure" is used at the beginning of a sentence and "Fig." is used in sentences, "Figure 3" at L317 is not at the beginning of the sentence, is this correct?

(3) Figure 5 is referred (L329) prior to Figure 4 (L368). You need to swap Figure 4 and Figure 5.

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(4) Table 4 is referred prior to Table 3. You need to swap Table 3 (L375) and Table 4 (L291). The order of Table 3 and Table 4 is also the same

(5) Is the writing style "km 7000" in L309 correct? This notation can be found in several other places such as L309, L322, L326, L331, L334, L336, L343, L346, L386, L403, L590, and L598.

(6) In "Reference list", journal names written by full notation and abbreviations are mixed.

(7) In Figure 2, gray shaded areas denote not only the part of sharp increase in DMS concentration, but also the part of its high concentration (and its sharp decrease). If you want to highlight only the part of its sharp increase, carefully mark the part only where the DMS concentration increases.

(8) List of technical errors L53: Is "three order" correct?

L59: At the end of L59, not period but comma.

L70~L71: Invalid way to cite the references written in L70-L71; DMS emissions (Chang et al., 2011), (Mungall et al., 2016) => DMS emissions (Chang et al., 2011; Mungall et al., 2016)

L92: mixed layer depth => mixed layer depth (MLD) L234, L280, L290, L534, L615,

L914: mixed layer depth => MLD

L128, L155, L200: The notation of "membrane inlet mass spectrometry (MIMS)" is to be used only at the first quotation, and the abbreviation (MIMS) should be used at subsequent citations.

L130, L156 The notation of "OSSCAR" is same as my comment for "MIMS".

L138: "(July 10-August 20, 2015)". Is parenthesis "()" necessary?

L147: shallow, narrow straits => shallow and narrow straits

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L263: Where => where

L306: 18nM => 18 nM

L316, L317: 29nM => 29 nM, insert half-size space after "29" 52.31mmol => 52.31 nmol

L314: Is "(measured with OSSCAR)" necessary? If so, () is necessary?

L331: sea-air flux observed => sea-air flux calculated (or estimated)

L348: (Fig 2c) => (Fig.2c) insert period after "Fig".

L360: Is (G) in "Gradients (G) for each variable" necessary here?

L416: Quotation "Wolfe et al (2002)" at the end of L416 and the same author's quotation at the end of the sentence of L418 are duplicated (the latter is unnecessary).

L444: Fig 6a,=> Fig. 6a

L446: Insert a half-size space between "(Fig. 6b)." and " The result,,".

L459: heavily => mainly

L461: drawn => obtained

L474: in the Northwest Subarctic => in the northwest subarctic

L474: Lizotte et al (2012) => Lizotte et al. (2012)

L500: Either "Previous" in L500 or "previously" in L501 is unnecessary.

L514: (Tremblay et al., 2011) in the end of sentence should be deleted.

L540: (Matrai et al. 1997) => (Matrai et al., 1997) Need comma after "et al."

L553, L554, L556: nM ug-1 => nmol ug-1

L560^{ij} ŽDMSP:Chl and HPLC => insert "a" after chl in italic. DMSP:Chl a and HPLC

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L585: [30a] Reference?

L601-L602: Gali et al. (Gali et al., 2010) => Gali et al. (2010)

L613: Gabric et al (2005): Need period after "et al". Year of publish of this paper is 2004, not 2005.

L616: DMSP:Chl a ratios :Chl a should be italic.

L844: 20244. => 20244 (Delete period after 20244.)

L885: Adapted from (Coupel et al. 2015). => Adapted from Coupel et al. (2015).

L997: show denote =>Choose either "show" or "denote".

L1024-L1025: What are the grey area in these figures? Are the same as Fig.2?

L1040-L1041: Explain the panel (a) and (b).

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