

REPLY to Anonymous Reviewer #2

We thank the Reviewer for the very positive comments. We report our point-by-point response to the specific comments raised in her/his review:

1. In section 2.5 of the manuscript, the details for the operating method and condition of UHPLC-HESI-Orbitrap-MS are provided. However, the information for the target compounds including creatinine is not provided. The analytical method for the target compounds including calibration results, QA/QC should be included in this section.

Calibration results of the UHPLC-HESI-HRMS measurements are now given in a more detailed manner in the Supplement, including calibration function, regression coefficient and retention times (new table S2):

“Table S2. Creatinine calibration results by UHPLC-HESI-HRMS

Calibration std.	Conc. (ng/mL)	Peak area (a.u.)	RT (min)
1	1.2	6302965	0.33
2	12	56953602	0.33
3	120	440017098	0.33
Calib. Function*	$(3.61E6 \pm 0.009E6)x$	$+(7.53E6 \pm 6.21E6)$	
R ²	0.999		

*Linear least squares fit in MS Excel 2010”

2. This study analyzed seawater generating aerosol using bubble chamber. However, the methodology and information how to generate aerosol from seawater is not available in this manuscript.

The methodology is described in the second paragraph of Section 2.2. We included a more comprehensive description clarifying the protocols used to produce the samples discussed in this study in comparison with the methodology employed for the online measurements discussed in the previous publication by Dall’Osto et al. (2017):

“Seawater was pumped from a depth of 4 m to fill an airtight high grade stainless steel tank (200 L) designed for aerosol generation experiment. Sea ice samples were also introduced and melted in the tank for dedicated experiments. Water was dropped from the top of the tank as a plunging jet at a flow rate of 20 L min⁻¹. The entrained air formed bubbles that, upon bursting, produced sea-spray aerosol, as reported in O’Dowd et al. (2015). Particle-free compressed air was blown into the tank headspace (120 L min⁻¹), which had outlet ports leading to samplers for the collection of filters and the subsequent off-line chemical characterization of the produced sea-spray. In particular nine sea-spray aerosol samples were collected for approximately 72h by a PM1 sampler (flow rate 40 lpm) equipped with pre-washed and pre-baked quartz-fiber filters (PALL, Ø= 47mm). Parallel bubble-bursting aerosol generation experiments with the same seawater and sea ice samples were carried out using a smaller glass tank (10 L) continuously flushed with particle-free air (11 L min⁻¹) (Schwier et al. 2015) and were dedicated to seaspray aerosol characterization using online mass spectrometers (HR-ToF-AMS and ATOFMS). The results from the bubble bursting experiments in the small tank are already reported in Dall’Osto et al. (2017).”

3. In 3.3.1. Ambient aerosols from the Weddell Sea: Check the sample labelling in Figure 1. There are no information for sample A-0911.

The correct labelling was indeed A-0901. We corrected the text.

4. English expression is ambiguous in the manuscript. Please revise the whole of the paper to improve English expression.

We have now removed the phrases with awkward syntax or with ambiguous expressions.

References:

Dall'Osto et al., Antarctic sea ice region as a source of biogenic organic nitrogen in aerosols, *Scientific Reports*, 7, 6047, doi:10.1038/s41598-017-06188-x, 2017.

Schwier et al. Primary marine aerosol emissions from the Mediterranean Sea during pre-bloom and oligotrophic conditions: correlations to seawater chlorophyll a from a mesocosm study. *Atmos. Chem. Phys.* 15, 7961–7976 (2015).