

We thank Referee 2 for all comments on our manuscript. Please find below our answers to all of them.

General comments:

R1: In the manuscript, you note that there is a good correlation between the two employed techniques but that the results are not on a 1:1 line. I would recommend discussing a bit further for example mentioning that the PTR measurement is showing higher concentrations. Besides, while the PTR directly measures the DMS concentration in air there might be potential losses of DMS in the other technique. Was there a possibility to do a comparison in the lab of the two techniques? This could also help to find out if the instruments actually worked well. It would also help to know which E/N ratio was used for the PTR as that has an influence on the performance of the instrument and if it was calibrated before and after the measurements. Which m/z was used to track the DMS signal in the PTR?

Authors: We thank the referee for these questions. The referee is right, we did not mention which instrument showed higher concentrations, and we have added this information to the manuscript. We acknowledge that there might be some potential reasons for the discrepancy between the two instruments. For instance, the canisters can experience loss during storage, leading to lower values, and the PTR cannot distinguish between compounds at the same mass, leading to potentially higher values. In addition, it is possible that some issues occurred with the calibration and standardization which applied in one or both techniques and, therefore, led to the discrepancy between the two instruments. The latter is the most likely explanation, as the loss/artifact explanation would be unlikely to produce the good correlation between the methods. However, the exact reasoning cannot be addressed at this late stage. We have added the mentioned information to the supplemental material. The two instruments were not directly compared, as they were independent measurements made at different locations (PTR on board, canister filled on board and measured in the lab). The PTR-ToF-MS was operated under standard conditions, pressure 2.2 mb, E/N 137, and mass resolution between 3700-4000. The PTR-ToF-MS was calibrated at the beginning, during, and at the end of the cruise. DMS was measured at mass 63.026 and calibrated to a gravimetrically prepared pressurized standard (Apel Riemer Environ. Inc, USA). We have added this information to the text.

R2: Regarding the atmospheric DMS concentrations, I was wondering if you could compare your data to results from satellite data?

Authors: It is not clear what is meant by this comment. To the best of our knowledge, there are no direct measurements of atmospheric DMS by satellite. There are indeed estimates of dissolved DMS concentrations by using satellite data. This latter approach is, however, beyond the scope of our manuscript.

R3: I was wondering about the roughness of the sea during the cruises. For concentrations of gas and particulate species in the marine atmosphere, the structure of the surface of the ocean is quite important. Figure 7 shows wind speed that as is mentioned in the manuscript is often correlated with

DMS concentrations. What about wave breaking? Do you have measurements of wave height or where the waves started breaking? Was there wave breaking in the regions defined as "coastal stations"?

Authors: We agree that wave breaking plays an important role in the sea-air gas transfer process. Unfortunately, no measurements of wave height or wave breaking were made during the cruises. Additionally, the wind speed is shown and discussed (mostly) because typically used bulk flux calculations employ gas transfer parameterizations based on wind speed. Thus, wind speed is directly used to determine the fluxes. To date, there are no heavily used (vetted) gas transfer parameterizations using wave parameters.

R4: you mention "terrestrial DMS sources" – did you mean terrestrial sulfate sources? Or what would terrestrial DMS sources be?

Authors: Please see our comment to referee 1 (R5).

Technical comments:

Sometimes there is a strange thing with the font. For example on page 3, line 76: the symbols in "°S" are too close to each other, a similar issue occurs with the word "Niño" on page 3, line 91 and in later occurrences of the word. Page 2, line 43: in the sentence starting with "Some studies.." there is only 1 reference. Either change to "The study by xx .." or add more references.

Authors: All corrected.