

## ***Interactive comment on “BrO measurements over the Eastern North-Atlantic” by M. Martin et al.***

**M. Martin et al.**

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### **Reply to the Interactive Comment of Referee 1.**

We would like to thank Referee 1 for the response and the suggestions for improving our manuscript. In the following we answer specifically to his remarks.

*- Did you have a look if you could gain any extra information by comparing the campaign data with satellite observations from the relevant time period and region?*

**Reply:** Satellite data cannot provide further information, as the detection limit of a satellite is too high to detect the measured *BrO* values. For a more detailed explanation, we refer to our answer to the Comment of Referee 2.

*- If satellite maps of marine biogenic activities would be available, they could possibly also add to the discussion - any chance to add more information here? It would be*

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*quite interesting to find out more about if the source is rather land-based or marine - or both ... . I suspect it would be hard to find additional information to pin this anymore down than you have already in the manuscript but can't do harm to try and collate as much information as possible.*

**Reply:** We agree, that it would be interesting to get further information about the sources. However, so far we did not find any conclusive marine biology data for the time of the cruise but we will check this in more detail.

*- I assume there were no in-situ ozone measurements made during this cruise?*

**Reply:** No, unfortunately no ozone measurements were undertaken during the cruise. Furthermore, the expected ozone reduction would be below the measurement error of ozone instruments.

*-Page 9295, lines 5-7: The 2 sentences about IO don't really belong into the introduction and should definitely be in the conclusions section. It is a "null result" but still useful information!*

**Reply:** We will change the manuscript as recommended.

*-Page 9296, lines 10/11: How well did the gimbal mount work - can you provide an estimate on how much movement you would expect in terms of degrees for the elevation angles used? This is quite important when looking at quantitative values deduced from the MAX-DOAS measurements.*

**Reply:** The angles of the gimbal mount did vary in a range of  $1^\circ$  to  $2^\circ$  for windy days, and less for days with less wind. This does make of course a bigger difference for smaller elevation angles, but will not significantly change the results. We agree with the referee, that this is an important information, which shall be added in the manuscript.

*-Page 9296, lines 12-16: Did the approach using 3 telescopes with about 20deg offset in azimuth provide you with some additional information re the horizontal distribution? Was that part of the agenda when you set up the instrumentation in this way?*

**Reply:** Yes, it was part of the agenda, when setting the telescopes up as described. However, although it seemed as if the shift in the azimuth angle shifted the measured BrO signal chronologically, the shift was very small. It could therefore also be caused by the fact, that the telescopes run up the elevation angles one after the other. By increasing the azimuth angle even more, maybe the effect would be possible to determine clearly, which would be a very interesting point for further investigations.

*-Page 9302, lines 10-12: Right, but the amounts measured on 12 and 16th Feb are also very low and much further south!!*

**Reply:** This sentence might not have been formulated totally clear, what we wanted to say is, that, even so there were days with low concentrations in the south, there were no days with high concentrations further north. This might have been caused by the bad statistics, as we did not measure many days further north, but might also lead to the conclusion, that there is less BrO there. As the event measured on February 18th occurred during a very short time span, we concluded, that it cannot come from a constant source with large extend and that the source must have been close. Thus, the probability to detect higher concentrations is higher further south.

*-Fig. 2: Definitely a very appealing figure which conveys quite some information at once. However, I do find the "error bars"; a bit misleading since they are not actual real errors but are a mix of error and real variability over the day, right? Maybe it would be safer to just refer to it as standard deviation. I also noticed that daily mean values for 11 and 13 Feb are missing. Why is that? Due to the instrument malfunctions briefly mentioned in the paper under section 2.2?*

**Reply:** The error bars shown in the graph are the standard deviation for each measurement point. Error bars might have been a misleading word, which shall be changed to standard deviation in the script. The data on February, 11th is missing, because of the malfunctions of the instrument. There is data available for this day, but with many gaps in between. Therefore it was not considered as trustworthy. On February 13th, the ship

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was partly in the harbor of Mindeloe at the Cape Verde Islands. The instrument was running than, but as it was measuring polluted air we also decided not to consider this day.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 9291, 2009.

**ACPD**

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