

## ***Interactive comment on “Ozone in the Boundary Layer air over the Arctic Ocean – measurements during the TARA expedition” by J. W. Bottenheim et al.***

**J. W. Bottenheim**

jan.bottenheim@ec.gc.ca

Received and published: 29 June 2009

We thank Dr. Kaleschke for his comments and wish to respond as follows: (note that we add a PDF version of these responses for better clarity of the attached figures)

Reviewer's comment: In the potential frost flower data one can see that the conditions for enhanced frost flower growth move from the north of Svalbard around April 16/17 towards Franz-Josef Land on April 18 arriving at Severnaya Zemlja on April 19 (see attached Figures below). Thus, the area displayed in Figure 6 is not the only possibility for the origin of ODEs. A more detailed study using a suitable air chemistry transport model would be a possible approach to check the validity of different hypothesis about

C2333

the origin. Response: Although there were areas with high PFF on April 17/18 in the north Svalbard to Franz-Josef Land, wind patterns on the same dates indicate air trajectories going away from TARA instead of toward TARA. On April 19, wind patterns show a short eastward motion from the polynya (east of Taymyr Peninsula) then merging to the transpolar direction toward TARA, thus leading to ozone depletion observed at TARA. See figures below.

Reviewer's comment: Change the title to be more specific Response: Changed as suggested

Reviewer's comment: 240: Add suitable image of mean BrO distribution Response: We have reservations about how to interpret the SCIAMACHY images but we have added an image of the column density of BrO for April 2007. We expanded the text to explain our reservations.

Reviewer's comment: 275: Define waning phase of frost flowers. Response: “Waning phase” means “decaying phase”. We revised the manuscript to change the wording.

Reviewer's comment: 335: “. . . and hence leading to ozone depletion”. Conclusion could be challenged. Response: We agree with the reviewer and have added this hypothesis in the text.

Reviewer's comment: Figure 1, combine ice conditions with TARA track Response: We have decided to keep the figures independent. Efforts to do as suggested unfortunately made the figure virtually unreadable.

Reviewer's comment: Figure 5 require more detailed description. Response: We agree that Figure 5 was poor to understand. We have changed the figure to show the actual 3-day back trajectories on a geographical map.

Reviewer's comment: Figure 6: Improve quality of the figure. Provide colorbars or definitions to establish a relation to the backscatter coefficient. Response: The caption of figure 6 is revised to provide the relation to backscatter coefficient (in dB) as

C2334

suggested by the reviewer.

Please also note the Supplement to this comment.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 8561, 2009.

C2335

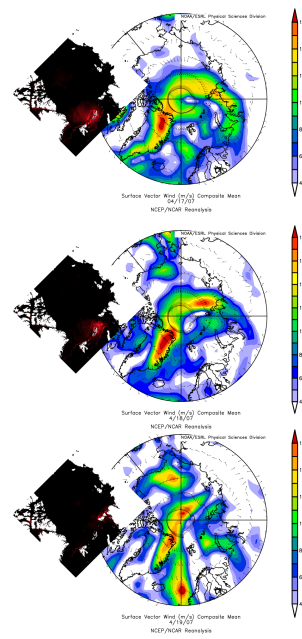


Fig. 1.

C2336