Ocean Sci. Discuss., 4, S183–S185, 2007
www.ocean-sci-discuss.net/4/S183/2007/

Ocean Science Discussions

Interactive comment on "Spectral studies of ocean water using DOAS" *by* M. Vountas et al.

M. Vountas et al.

Received and published: 9 July 2007

Response to the comment of T. Wagner

The authors would like to thank T. Wagner for his reading of the paper and appreciate his comment. We answer here to his comment and explain why we wrote our paper in the following way.

Background

In the SCIAMACHY proposal (published by the Max Planck Institute for Chemistry 1988), the use of the low spatial but high spectral information for the retrieval of ocean color data products was specifically addressed as one of the secondary scientific objectives, and complementary to the existing high spatial but low spectral resolution instruments.

Comments:

T. Wagner states: *"In our work it was shown (probably) for the first time that oceanic biological activity can be observed using spectral information from GOME."*

Vasilkov et al. (2002), Vountas et al. (2003) and Joiner et al. (2004) showed an alternative approach using backscatter ultraviolet instrumentation (GOME on ERS-2) utilizing Vibrational Raman Scattering (VRS) spectral signature of liquid water. They clearly demonstrated the capability to evaluate oceanic chlorophyll content using VRS at moderate to high spectral resolution.

Vountas et al. (2003) showed that to include the DOAS fitting of vibrational Raman scattering makes significant improvement for retrieving (atmospheric) BrO from GOME. Sierk et al. (2004) describe the use of the DOAS method to retrieve phytoplankton absorption from SCIAMACHY data. These results were shown to be in good agreement with the SeaWiFS chl a data product retrieved nearly simultaneously.

The publications of Vasilkov et al (2002), Vountas et al. (2003), Sierk et al. (2004) and Joiner et al. (2004) are cited in our manuscript but are not cited in Wagner et al. 2007. This is presumably because the focus of their manuscript addressed a somewhat different issue: the use of the red spectral region over land. In Wagner et al. (2007), the use of DOAS for the retrieval of a vegetation index was described and utilized to improve trace gas retrievals in the considered region between 610 and 690 nm. It was proposed that the vegetation index over ocean indicated oceanic biological activity in ocean waters, but it was neither clarified nor elaborated what is meant by "biological oceanic activity" nor is any quantitative or qualitative validation by comparison with other ocean color measurements from satellite sensors or in situ data measurements described.

Comparing the results in Wagner et al. (2007) for instance Fig. 7 and 8 to SeaWiFS chl-a data for the same months qualitatively an arbitrary correlation is visible at selected locations (e.g. around Australia) whereas there is none at other locations (e.g. around the Malaysia, Indonesia, East of South America). A reason might be that within the

OSD

4, S183–S185, 2007

ocean the absorption by water itself dominates the red spectral range above other spectral signatures.

T. Wagner states: *"It was also shown that including vegetation spectra can improve the retrieval of atmospheric trace gases. These results were also confirmed by radiative transfer modeling. Moreover, and probably more important, it was shown how such observations can be interpreted in a quantitative way."*

Certainly this analysis is important for trace gas retrievals in the considered wavelength region but is irrelevant for the focus of our manuscript. Here, we clearly focus on aquatic parameters.

Conclusion

However, we are happy to add a reference to the Wagner et al. manuscript:

"Wagner et al. (2007) proposed an approach to investigate vegetation over land using the DOAS method in the red spectral range. They suggest that this method has the potential to retrieve also biological activity in oceans. However, qualitative comparisons of their results to SeaWiFS chl-a data show arbitrary correlations. The reasons for this is are unclear."

Overall we respectfully suggest that the authors of Wagner et al. (2007) manuscript might reconsider their approach to citation.

Interactive comment on Ocean Sci. Discuss., 4, 459, 2007.