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Atmospheric Measurement Techniques Discussions

Interactive comment on "Vertical profile of tropospheric ozone derived from synergetic retrieval using three different wavelength ranges, UV, IR, and Microwave: sensitivity study for satellite observation" *by* Yasuko Kasai et al.

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Dear Dr. Sellitto

We would like to thank Dr. Sellitto for pointing out missing of references in our manuscript. Sellitto et al., 2012a, b performed tropospheric ozone retrieval using the SCIAMACHY nadir UV and VIS measurements. They used a new method based on neural network technique, and showed a significant improvement of the tropospheric ozone retrieval by using the UV and VIS measurements. These works should be cited

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in our paper as you mentioned. We modified our manuscript as below.

Page 2 Line 33 “the tropospheric ozone retrieval using the optimal estimation method (OEM) (Rodgers, 2000)” was added.

Page 3 Lines 7 – 10 “The other approach to retrieve the tropospheric ozone profile using neural network technique was performed with the SCIAMACHY nadir measurements in the UV and VIS ranges (Sellitto et al., 2012a, b). They also showed a significant availability of combining several wavelength ranges to retrieve the tropospheric ozone profile.” was added.

Page 4 Lines 10 – 13 “The VIS (340-505 nm) and shorter UV spectral region (< 305 nm) were not taken into account, because little information on surface ozone can be extracted from measurements in these ranges (e.g., Bak et al., 2012). Moreover, the wavelength dependence of the surface reflectance, absorption of NO2 and the Ring effect were out of the scope of the study.” → “We decided not to include the VIS (340-505 nm) and the shorter UV spectral range (< 305 nm) in this study, although the benefit of adding VIS wavelengths has been reported (Sellitto et al., 2012a, b). The reason why we excluded these ranges is because the wavelength dependence of the surface reflectance, absorption of NO2 and the Ring effect were out of the scope of the study.”

References “Sellitto, P., Del Frate, F., Solimini, D., and Casadio, S.: Tropospheric ozone column retrieval from ESA-Envisat SCIAMACHY nadir UV/VIS radiance measurements by means of a neural network algorithm, IEEE Transactions on Geoscience and Remote Sensing, 50, 998–1011, doi:10.1109/TGRS.2011.2163198, 2012a” was added.

“Sellitto, P., Di Noia, A., Del Frate, F., Burini, A., Casadio, S., and Solimini, D.: On the role of visible radiation in ozone profile retrieval from nadir UV/VIS satellite measurements: An experiment with neural network algorithms inverting SCIAMACHY data, Journal of Quantitative Spectroscopy and Radiative Transfer, 113, 1429–1436, doi:10.1016/j.jqsrt.2012.04.007, 2012b” was added.

“Bak, J., Kim, J. H., Spurr, R. J. D., Liu, X., and Newchurch, M. J.: Sensitivity study of ozone retrieval from UV measurements on geostationary platforms, Remote Sensing of Environment, 118, 309–319, 2012.” was removed.

Sincerely yours,

Tomohiro Sato and Yasuko Kasai

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Please also note the supplement to this comment:
https://www.atmos-meas-tech-discuss.net/amt-2017-98/amt-2017-98-SC2-supplement.pdf

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