

The reviewers' suggestions are in italic.

All of the revisions, which were made by following the suggestions from reviewers, are in [blue](#).

Dr. Pasquale Sellitto's suggestions:

The Authors introduce their work by mentioning a number of recent studies on the combination of different spectral regions (UV, VIS and TIR) for increasing the vertical resolution of tropospheric trace gases, in particular ozone. All of these studies are based on simulated observations. Anyway, there exists a published work on a multispectral inversion scheme to retrieve ozone information from real SCIAMACHY observations, i.e., by using UV+VIS:

P. Sellitto, F. Del Frate, D. Solimini, S. Casadio, Tropospheric Ozone Column Retrieval From ESA-Envisat SCIAMACHY Nadir UV/VIS Radiance Measurements by Means of a Neural Network Algorithm, IEEE Transactions on Geosciences and Remote Sensing, Volume 50, Issue 3, Pages 998-1011, 2012.

The improvements brought by this multispectral approach, in particular in the troposphere, are discussed in the following publication:

P. Sellitto, A. Di Noia, F. Del Frate, A. Burini, S. Casadio, D. Solimini, 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, Volume 113, Issue 12, Pages 1429-1436, 2012.

To my knowledge, these are the first (and, for the moment, the only) published studies of multispectral retrieval with real observations and they are surely very pertinent for your work. I suggest the Authors to take a look at those publications and add them as references to their paper, i.e., by explicitly mentioning that they are the first experiments of multispectral retrieval with real observations.

Re: We cited Sellitto et al. 2012a,b by revising the Page 27591 line 21.

“SCIAMACHY (Eichman et al., 2004; [Sellitto et al., 2012a,b](#))”

We added two references in Page 27622 line 18:

[“Sellitto, P., Frate, F.D., Solimini, D., 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 Geosciences and Remote Sensing, 50\(3\), 998-1011, 2012a.](#)

[Sellitto, P., Noia, A.D., Frate, F.D., Burini, A., Casadio, S., 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\(12\), 1429-1436, 2012b.”](#)

Worden et al., 2010 demonstrated an elegant study, which performs multispectral retrievals with real observations to provide near surface carbon monoxide from space. Worden et al., 2010 have been published much earlier than Sellitto et al. 2012. The near surface CO products have been extensively applied in the multiple research topics. Hence, we cited Worden et al. 2010 in our paper.

Worden, H.M., Deeter, M.N., Edwards, D.P., Gille, J.C., Drummond, J.R., and Nédélec, P.: Observations of near-surface carbon monoxide from space using MOPITT multispectral retrievals, *J. Geophys. Res.*, 115, D18314, doi:10.1029/2010JD014242, 2010.