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Interactive comment on “Glyoxal retrieval from the Ozone Monitoring Instrument” by C. C. Miller et al.

Anonymous Referee #3

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This manuscript presents a new algorithm for the retrieval of glyoxal from the OMI instrument, a method which can in theory be applied to other satellite platforms. The results show an improvement over the past satellite estimates when compared to the ground observations and add value to the large uncertainties in satellite retrievals of glyoxal. I recommend the publication of this manuscript after some changes, which are detailed below.

1) Recently a paper on ground based observations of glyoxal in the marine environments has been published (Mahajan et al., 2014). The measurements from the ground seem to compare well with the new algorithm estimates. A detailed comparison between the two datasets should be presented to see where the estimates match, and where they do not. The results and discussions section should also include a comparison between ground based and satellite observations in the remote environments.

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2) Although there is a brief discussion on the differences between the retrieval routines from the past estimates, no direct comparison of the retrieved VCDs is done. A detailed comparison with the past methods should be included, with quantified differences over different environments – if possible, include a figure of the differences.

3) Have the authors checked the sensitivity of the retrieval to different O₄ cross-sections (Greenblatt et al., 1990; Thalman and Volkamer, 2013)? The ground based data appears to be sensitive to the cross-section used, and it would be interesting to know how sensitive the satellite retrievals are to the O₄.

4) Please provide more details on the GEOS-Chem glyoxal profiles – especially over regions where the glyoxal is very close to the detection limit.

5) What is the detection limit estimated in the different environments?

6) Include missing past publications: (MacDonald et al., 2012; Mahajan et al., 2014)

7) What are the errors on the AMF – have these been propagated?

References Greenblatt, G. D., Orlando, J. J., Burkholder, J. B. and Ravishankara, A. R.: Absorption Measurements of Oxygen Between 330 and 1140 nm, *J. Geophys. Res.*, 95(D11), 18577–18582 [online] Available from: <http://dx.doi.org/10.1029/JD095iD11p18577>, 1990.

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 6065, 2014.

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7, C1759–C1761, 2014

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