

## ***Interactive comment on “Temporal and spatial variability of glyoxal as observed from space” by M. Vrekoussis et al.***

**Anonymous Referee #2**

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This article presents a thorough evaluation of the observational record of glyoxal from the SCIAMACHY instrument. Overall, the manuscript is well written and should be published with a minimal amount of editing in response to reviewer comments.

Comments

Did the authors calculate the correlation between the concentrations inferred from the SCIA and the surface obs? Such analysis including statistical significance and a scatter plot would be preferable, or a nice addition, to the bar chart of Fig 3.

Further, in the discussion of the comparison between these two, it is noted that the SCIA values are generally higher. There is some discussion of the resolution error in degrading the observations to 1x1 which is used to explain the measurements being

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higher than SCIA near anthropogenic sources. Later, in section 3.5.2, there is discussion of how averaging over larger boxes decreases the concentrations, this time near biomass burning sources. Are these two invocations of resolution error consistent? And why is the analysis done at 1x1, rather than the resolution of the SCIA instrument (30x60km)?

It's not clear at first what Fig 5a is showing. Please elaborate in the text.

The introduction (sections 1 and 2) is too long. Given that this is not the first paper to present SCIA retrievals of glyoxal, it isn't necessary to go into as much detail. Similar for description of glyoxal budgets and chemistry; relying more on citations to papers such as Wittrock et al, 2006, Wittrock 2006, Fu et al 2008, and Myriokefalitakis et al, 2008 is advised. Otherwise, your readers might get a bit impatient (as I started to get) and give up before getting to the real content of this article. For example, sections 2.2 - 2.5 could be condensed. The titles of 2.2 and 2.3 alone are redundant.

Why the use of CHO.CHO instead of just saying glyoxal? The article readability would be much improved by just saying glyoxal.

When mentioning that convection of organic aerosols on page 9015, it's not clear what you are suggesting. That glyoxal is evaporating from the OC to be observed by SCIA, or that these are depositing into the ocean leading to a source of carbon that later enhances production of glyoxal from the surface layer?

8996, 24: extend → extent

8998, 9: columns surrogate → columns are a surrogate

9012, 25: regions regions → regions

9015 13: reach → rich

The use of commas is excessive. I realize that sometimes a comma seems optional, but in the following places it is not appropriate and should be removed: 8995 16:

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whereas human  
8995 22: distribution make  
8998 17: HCHO make  
8998 20: distribution and  
9000 17: DOAS is  
9000 25: photons during  
9002 8: AMF on  
9002 9: regions where  
9004 8: areas having  
9004 10: regions where  
9006 6: that high  
9006 15: VCD for  
9006 16: 2007 shows  
9008 7: interest where  
9013 7: increase found  
9013 8: also in  
9015 4: regions where

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 8993, 2009.

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