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Atmospheric Chemistry and Physics Discussions

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

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

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