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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric Carbonyl Sulphide (OCS) measured remotely by FTIR solar absorption spectrometry" *by* Geoffrey C. Toon et al.

Anonymous Referee #1

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General comments: The authors present the measurements of OCS using MkIV FTIR spectrometer from both balloon campaigns and ground-based observations, and analyze the long-term trend and seasonal cycle. OCS is suggested to provide additional insights on carbon cycle, because of its similarity to CO2 during plant uptake. To use column measurements in the application, the OCS variations in the troposphere need to be extracted out. In this paper, the N2O column measurements are used to account/correct the stratospheric variations, because OCS and N2O share a similar profile shape and N2O is stable in the troposphere, which has been used on CH4 in other studies. This paper is a valuable contribution for making use of the OCS column measurements on the tropospheric variation. I recommend publication of this work in

ACP after minor revisions. Specific comments: 1. Line 51: it may worth to write the current uncertainties of using OCS to study the carbon cycle, such as the ocean and soil. It does not need to be a full review, but not mentioning it at all could not give the readers a clear view on the topic. 2. Line 125: could you explain more detail on why the weaker OCS bands provide more information than the strong bands at lower altitudes? Maybe show the AVKs from different bands. 3. line 190: Can authors give the confidence level of the relationship? It would be good to mention this uncertainty when using N2O2K to correct OCS stratospheric variations. 4. It would be better show the linear fitting between P and N2O in Fig.A.2, and mark the Pb and b. It will help the readers to understand how the N2O column above Pb is calculated in line 724. Technical corrections: 1. The format of the citations should be consistent, the authors sometimes use "()", sometimes use "[]". I think ACP uses "()". 2. Line 27: the full name of CS2 should go to the previous sentence where it's mentioned the first time. 3. line 116: Figure 1: the titles of subfigures are cut off; the y-axis of upper right panel is not clear. The same problem is also in the Figure 5. 4. Line 706: change "N2O=120 ppt" to "N2O=120 ppb".

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