

***Interactive comment on “First year of upper tropospheric integrated content of CO<sub>2</sub> from IASI hyperspectral infrared observations” by C. Crevoisier et al.***

**Anonymous Referee #1**

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The manuscript of Crevoisier et al. covers an important and relatively new scientific topic, namely the retrieval of atmospheric CO<sub>2</sub> information from global satellite measurements and the interpretation of the results in terms of CO<sub>2</sub> surface fluxes and other important aspects such as atmospheric transport pathways. The manuscript is well-suited for ACP. It covers an important topic, provides new results and is well-written. Therefore I recommend its publication in ACP after the items listed below have been addressed by the authors.

Abstract

Line 13: I recommend to replace accuracy (systematic error) by precision (random

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error) as the analysis method (e.g., Section 4.2) is based on the standard deviation of the retrievals and not on the determination of systematic biases relative to accurate reference data of known quality. This recommended modification also applies to the Conclusions section.

Line 25: It is not clear if parts of the retrieved pattern are really due to biomass burning CO<sub>2</sub>. I therefore recommend to add more evidence that this really has been observed or to remove item (4) listed in the Abstract.

Section 3.3 Radiative bias removal

Please add which assumptions on CO<sub>2</sub> have been used here.

Section 4.1 Seasonal cycle

Page 8202, line 4: Amplitude decrease with latitude: Is this in line with expectations or in contradiction to this? Please comment on this.

Section 4.2 Geographic distribution

Page 8205, paragraph starting with "Signatures of biomass burning ...". From the evidence given in the manuscript it is not clear if the observed CO<sub>2</sub> pattern are really due to biomass burning CO<sub>2</sub>. It appears that the authors are also not entirely convinced about this (e.g., "might explain" in Line 13). I recommend to either provide more evidence or to replace statements such as "can be seen" (Line 5) with "can potentially be seen" or equivalent (also in the Abstract and in the Conclusions section).

Conclusions

Page 8207, line 25: It has not been shown in the paper that IASI has already provided new insight into atmospheric transport pathways. I therefore recommend to replace "IASI retrievals bring ..." by "IASI retrievals potentially bring ...".