

Interactive comment on “Characterisation of GOME-2 formaldehyde retrieval sensitivity” by W. Hewson et al.

Anonymous Referee #2

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This is a nice expose of the retrievals of formaldehyde columns, including a detailed discussion of the relative importance of errors that contribute to the total column error. I have some suggestions and comments that I would like the authors to consider but I recommend the paper be published.

The abstract should summarize the impact of different errors by defining “impact”.

Abstract and elsewhere: I felt the message about the reference sector method was a little unwise. This approach is only strictly valid for systematic error sources that are geographically and temporally invariant.

Introduction: Provide the reader with an idea of the background column due to methane

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oxidation and that will help emphasize the importance of the continental enhancement.

Introduction: The paper needs a reference for large HCHO enhancements over localized VOC sources. Plenty of aircraft campaigns that show this feature.

Introduction: Tell the reader the importance of OH and photolysis as sinks of HCHO.

Introduction: “Despite HCHO’s relatively high...” Relative to what?

Introduction: This reader appreciates the comprehensive nature of the referencing but the Eisinger et al reference is likely insufficient for a peer-review journal. The Thomas et al paper was a qualitative study over a limited biomass burning feature.

Introduction: Line 17: its’?

Introduction: I am being perhaps overly picky but I would question use of some words, e.g., engendering, dichotomy (section 3.1); in some instances they are inappropriate.

Be consistent with words, e.g., on-board and onboard, HCHO and CH₂O (text and figures).

Typo should be MetOp not METOP.

Section 3: I think the paper would benefit from a simple table that quantified the relative importance of each source considered in the paper. I suggest the authors consider a synthetic case in which they know the truth, impose realistic sources of error, and quantify the errors (retrieval minus truth).

Section 3.4.2. Quantify “minute”

Section 4.5: 4x5 – lat/lon?

Section 4.4: this section would benefit from a brief discussion of the competing aerosol and cloud processes that could lead to the same result regarding columns over places like the Amazon basin.

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Figure 6 captions has an odd start.

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