

Interactive comment on “Chlorophyll fluorescence remote sensing from space in scattering atmospheres: implications for its retrieval and interferences with atmospheric CO₂ retrievals” by C. Frankenberg et al.

C. Frankenberg et al.

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Dear Wouter Verhoef,

We are glad that the discussions were eventually performed in a more objective way.

Regarding your comment: *In your discussion paper you refer back to earlier peer-reviewed papers in which you demonstrate cases of near linear dependence, but already on the scale of the 750 - 770 nm window, where both solar and telluric absorption*

lines are active, this linear dependence has already decreased substantially. This can be quantified easily by means of singular value decomposition (SVD) of the Jacobian matrix, as you are probably aware of. We don't know where you see that this linear dependence has already decreased substantially. This is in fact not true. At lower spectral resolution than considered here, there would even be an almost perfect linear dependence between aerosols and fluorescence. Based on comments by Elizabeth Middleton, however, we added (at several places) that we are only addressing NIR Fs, not the full signal. We also removed all references to FLEX but in one position (where we believe to provide a very fair statement): A combination of O₂ A and B-bands, such as envisioned in the FLEX mission concept, would be preferred if spectral resolution is not high enough to exploit Fraunhofer line features.

As for your earlier comments, we wish to thank you for the detection of typos and some general good comments. Some changes we included based on your (and other) comments:

- full-physics in italics in abstract
- Added the following in the introduction: The term *full-physics* algorithm is commonly used in the atmospheric remote sensing community for retrievals based on the full modeling of the radiative transfer instead of parameterizations or a decoupling of the retrieval of trace gas slant column densities and radiative transfer modeling.
- changed “strongly saturated O₂ A-band” to “strong O₂ A-band”
- retrievec -> retrieved
- chlorophyll emission -> chlorophyll fluorescence emission
- removed “and suggested for the FLEX mission”

- not oxygen, like FLEX -> not oxygen

Best regards, Christian Frankenberg

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