

The manuscript by Martinez-Velarte et al. describes the influence of the Sentinel-5 SWIR detector persistence effect on the retrieval of various trace gases. A filtering method to reduce the impact is also discussed. The paper is well written; methods and results are in general described in a sufficient way, with some exceptions which require more explanation listed in the following comments.

General Comments:

1. The methodology section should make clear how instrument noise is handled. It seems that all simulations of spectra do not consider instrument noise, but this is not clearly written in the text. This may be valid because the persistence effect probably results in more systematic errors, but noise will affect the signal levels on the detector in different ways for high and low intensities, which may possibly influence the results. The same applies for e.g. dark signals, which are also not mentioned (and probably not considered).

The consideration (or not) of noise and darks should be stated in the text and a possible impact on the results should be discussed.

2. The results presented in the paper are mainly based on the simulation of three different regions for a constant geometry. How representative are these regions (and geometry) for the global data provide by Sentinel-5? How many data would be affected, and how many would be filtered out on a global scale? This would give more insight on how relevant the effect and possible correction would be.

Specific Comments:

1. p. 2, l. 58–59:
‘MicroCarb and CO2M adopt more stringent accuracy requirements for XCO2 (of 0.4 ppm...)’
Is there a reference for these accuracy requirement values?
2. p. 4, l. 115:
Please describe which spectroscopic data, especially which absorption cross sections, have been used. Are these the same as used in the operational retrievals?
3. p. 5, retrieval section:
Which a-priori values have been used? Are they equal to the true values? What about assumed a-priori uncertainties? Is this in line with the operational processing? Please explain.
4. p. 9, l 256:
‘we applied an a posteriori land-fraction filter to remove pixels partially or fully over water.’
Does this mean that Sentinel-5 will perform retrievals over water/ocean (maybe in glint mode)? If this is the case, a lot of data would possibly be filtered out, which is not considered in the numbers derived from the simulations. Please explain.
5. p. 21, Fig. 6:
‘The dotted lines denote the contour plots...’
These contour plots are not mentioned in the text. If these are relevant, they should be discussed; if not, they should be removed.

Technical Corrections:

1. p. 6, l. 165:
What is meant with ‘numerical range’ - please explain or remove.

2. p. 7, l. 205:
‘nits%’ - should probably be ‘%’?
3. p. 12, section B2:
A reference to this section should be given in the main text.
4. p. 21, Fig. 6:
Caption: ‘panel (C)’ → ‘panel (B)’
5. p. 23, Table 1:
Please include also the number of data points before / after the filtering (or the percentage filtered out) for each scene.