Response to Handling Editor.

We would like to thank the editor for taking the time to review our article, and for providing critical feedback on the manuscript. Below, we cycle through each of the comments in order of their appearance and provide a response. All edits have been implemented in the revised manuscript, where necessary.

Comments

1. L181-182. Summarize some of the "various reasons" for straylight for the reader's benefit.
    a. **We have added several examples of why they may be encountered.**
2. L185. What do you mean by "stray-light kernels"?
    a. **The stray light kernel is used to correct for unwanted (stray) light falling onto a region of the FPA. The kernel extends pixels in the spectral and spatial domain and corrects the contribution of light to a pixel's signal.**
3. L201. When you say "the parameterization of lambda with respect to spectral pixel index is assumed throughout" do you mean that lambda is the wavelength corresponding to the i-th spectral pixel but you omit the i subscript in the equation?
    a. **Yes, that is correct.**
4. Eq. 2. Are Doppler shifts due to Sun-Earth relative motion taken into account in computing the high-resolution solar spectrum? Or are they considered irrelevant for this purpose? I am asking because it is not uncommon that they are accounted for in GHG remote sensing from high-resolution SWIR spectrometers (e.g., O'Dell et al., 2012; Connor et al., 2016).
    a. **Yes. The solar spectrum includes this effect. However, the spectral resolution of the instruments is likely too large for this effect to be noticeable.**
5. L305-309. A lot of prior knowledge is required from the reader to understand references to ECEF, ENU reference frames, etc., but I suspect not many readers of this journal have such knowledge. It may be useful to explain these reference frames in an appendix or provide a reference to where the reader can look them up.
    a. **We have provided an extra few words prior to describing the orthorectification steps that will aid an interested reader to understand the process on a deeper level.**
6. L344. If I understand correctly, A-KAZE looks for the same features in the MethaneAir and in the MSI images. Is the Hamming distance used to assess which feature in one image corresponds to which feature in the other image? This was not entirely clear to me.
    a. **Yes. We have clarified this in the article text.**
7. L346. Add a citation to a paper describing the RANSAC method.
    a. **Yes, this has been added.**
8. Table 2. It is not exactly clear to me how you define a "success" and how you define a "failure".
    a. **A thorough description of how the success/failures are determined has been added to the document.**
9. L365. "Necessitated our need to..." -> "necessitated us to"?
    a. **Corrected in the document.**