

Atmos. Meas. Tech. Discuss., referee comment RC1
<https://doi.org/10.5194/amt-2021-238-RC1>, 2021
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Comment on amt-2021-238

Vladimir Savastiouk (Referee)

Referee comment on "Mapping methane plumes at very high spatial resolution with the WorldView-3 satellite" by Elena Sánchez-García et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-238-RC1>, 2021

Review of "Mapping methane plumes at very high spatial resolution with the WorldView-3 satellite" (Elena Sánchez-García et al.)

Vladimir Savastiouk

General comments.

This manuscript describes a novel technique for teasing out the methane signal from WorldView-3 satellite data in the 2235-2285 nm band. The method is described clearly with examples of implementation on simulated and real data. Monitoring of methane plumes is indeed very important and the proposed technique will contribute to better identification of the sources thanks to the high spatial resolution of WV3 at 3.7 m.

In my opinion, this paper can be published after minor corrections.

Specific comments.

1. I am not an expert on methane retrievals, but while the paper has a good discussion about the uncertainties it does not give a clear guidance on the absolute level of methane concentrations that can be detected with this technique. It will be useful to know, for example, whether this method can be used for detecting permafrost thaw methane leakage in the Arctic.

2. AMF calculations require some knowledge of the vertical distribution of the absorber. There is no indication in the paper as to what distribution is used for methane plumes.

3. The claim that the usage of Time-Delayed-Integration (TDI) of 16 lines contributes to a superior SNR is not supported by a reference or by an explanation why this is the case. It may be trivial to the authors, but maybe of interest to some non-expert readers.