

Atmos. Meas. Tech. Discuss., referee comment RC3
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Comment on amt-2022-43

Anonymous Referee #2

Referee comment on "Retrieval of greenhouse gases from GOSAT and GOSAT-2 using the FOCAL algorithm" by Stefan Noël et al., Atmos. Meas. Tech. Discuss.,
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This paper presents a new retrieval (FOCAL 3.0) for XCO₂, XCH₄, XH₂O, XCO, HDO, and XN₂O from GOSAT and GOSAT-2. It is exciting to see retrievals from GOSAT-2. The retrievals are validated following standard protocols. I was very interested by the scatter and temporal bias metrics relative to TCCON – they are not usually shown but I found them very instructive. I recommend publication in AMT but suggest that the authors consider the following comments:

- The Introduction advertises that comparisons with previous satellite products will be shown but I could not find these comparisons in the text.
- Equation (1) suggests that methane must be retrieved by the full-physics algorithm in order to derive a proxy estimate but that would erase much of the benefit of the proxy method in enabling successful retrievals when the full-physics method can't.
- Gradients in Figures 2 and 3 are so washed out as to make the Figures useless.
- Line 390: 'the data sets...are available from the authors'. That's OK at the submission stage but won't do at the publication stage. The data sets should be publicly posted.