

Review of the REVISED manuscript

“Greenhouse Gas Retrievals for the CO2M mission using the FOCAL method: First Performance Estimates”

General comments

The refined version improves the FOCAL-CO2M retrieval algorithm's assessment and should be subject to publication. The authors have enhanced the manuscript by addressing several key issues highlighted in the review. I appreciate and thorough responses in most parts. There are just a few minor points left to look at.

Minor comments

Does the profile resulting from the fit exhibit discontinuity vertically, with jumps in concentrations across the fitted layers? How to get from the fitted quantities to the final total column value?

Please provide a concise explanation of the scattering layer's terminology or setup within FOCAL, so that the reader can understand without having to refer back to the original paper. I think this might also enhance the understanding of why the Angstrom coefficient plays a significant role in the bias correction.

Specific comments

45: Consider to remove “from the top of the atmosphere” for clarity.

SC7/145/357: If the scattering layer in FOCAL is assumed to be infinitely thin, how is the scattering layer be defined---usually I use the term layer to describe something between two levels. The determined scattering components, such as the Angstrom coefficient and layer height, accurately represent which specific levels (everything below the infinitesimal thin scattering level)?

375: Is it possible to incorporate external aerosol data into FOCAL (at its current development stage)?