

Interactive comment on “Retrieval of tropospheric column-averaged CH₄ mole fraction by solar absorption FTIR-spectrometry using N₂O as a proxy” by Z. Wang et al.

Anonymous Referee #1

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The paper under consideration entitled "Retrieval of tropospheric column-averaged CH₄ mole fraction by solar absorption FTIR-spectrometry using N₂O as a proxy" by Z. Wang et al. investigates a novel method for inferring tropospheric XCH₄ from NIR solar absorption spectra. The method presented by Wang et al. is based on involving N₂O columns deduced from the same spectra (instead of using HF columns). The paper is a valuable contribution to the current debate of identifying the best approaches for the retrieval of tropospheric dry air mole fractions (DMFs) of long-lived trace gases from ground-based solar absorption spectra. In order to be of scientific usefulness, the observations need to achieve a high precision in the sub-percent range. I recommend

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publication of this work in AMT after minor revisions.

Technical comment: The wording of the paper seems often clumsy to me. Because the lead author is not a native speaker, I do not intend to blame him for that. However, I herewith urge the native speakers among the coauthors to carefully proofread the paper and apply corrections.

Contents: In the comparison of the CH₄ and N₂O approaches, essentially only time series are presented. For an adequate quantification of the systematic differences between the two approaches, it would be highly desirable to include a discussion of the annual cycle of e.g. the discrepancies, the dependence on H₂O column, the dependence on solar elevation and the dependence on station latitude.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 1457, 2014.

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