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Interactive comment on "Retrieval of tropospheric column-averaged CH_4 mole fraction by solar absorption FTIR-spectrometry using N_2O 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 elvation and the dependence on station latitude.

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