

Interactive comment on “XCO₂-measurements with a tabletop FTS using solar absorption spectroscopy” by M. Gisi et al.

Anonymous Referee #1

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This is a well-written manuscript describing a valuable scientific contribution. The authors clearly define their objectives and demonstrate that they have achieved them. Careful work in the construction and deployment of their spectrometer and in the subsequent analysis was necessary to demonstrate that they could produce a viable alternative (or adjunct) to the TCCON observations. They have done this, showing that the lower resolution Bruker EM27 spectrometer, in the hands of skilled experimenters, can make very useful, high precision observations of the total column of CO₂. The authors demonstrate an excellent command of English, and I hesitate to make corrections, however, I have made a few suggestions to ease the flow of the manuscript. My other questions and observations are generally minor and I recommend that the manuscript be published.

C2094

page 2, line 16 For the greenhouse gases I would list N₂O rather than CO.

page 2, line 24 "about 18" are we not sure that one of the sites exists

page 3, equation 1 I assume that .2095 is the mole fraction of O₂ in dry air. Why is it in this equation? Some brackets might make it clearer that .2095 is not multiplied by the denominator of the fraction.

page 3, line 25 Express container dimensions in meters. "and weigh"

page 4, line 2 "was recently investigated regarding the ability"

page 4, line 7 "requirement on"

page 4, line 15 "allows application of the tracker"

page 5, line 23 Remove one "stop"

page 5, line 25 Figure 3 is introduced before Figure 2

page 6, line 12 "structure move a geometric"

page 7, line 12 "allowing us to correct"

page 9, line 24 "refrained from"

page 11, line 19 "with line-mixing parameters that were"

page 11, line 23 "Merra-model data"

Figure 5 The systematically occurring solar line residuals do not seem to stand out from other residuals of the fit.

page 13, line 16 Is there a reference for the statement that the intensity and shape of solar lines vary as a function of the projected solar disc radius? Also, one might argue that there would be less variation in the solar output by averaging over a larger disc.

page 13, line 20 "superimposed on the"

C2095

page 15, line 4 It is convenient in the analysis, for both this work and for TCCON, to be able to introduce some "tuning" factors, but not very reassuring to this reader. With every tuning factor and adjustment we weaken the meaning of accuracy.

page 15, line 5 I also would have expected the EM27 and HR_Reduced to give the most similar results. In the HR_Reduced analysis was the same spectral region used for fitting as in the EM27 fitting?

page 15, line 11 I think it would be better to leave the discussion with "we do not know" rather than "we assume it is the ILS".

page 17, line 5 Replace "superimpose" with "overwhelm"

page 17, line 15 "good with values"

page 18, line 5 "accuracy" may not be the correct word here, perhaps "agreement"

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 5691, 2012.