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Discussions

Interactive comment on "Background CO$_2$ levels and error analysis from ground-based solar absorption IR measurements in central Mexico" *by* Jorge L. Baylon et al.

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Baylon et al. present a nice set of measurements of XCO2 from an FTS located at the high-altitude UNAO station near Mexico City. Measurements obtained with two different FTS beamsplitters are compared. CO2 and O2 are retrieved using a single prior profile with the PROFFIT code. It is shown that these gases can be retrieved with reasonable SNR using both beamsplitters and that only a small bias exists between these two measurement series.

Major comments: 1. As clear from the abstract and introduction, a major motivation for this work is to enable the Mexico UNAO group to develop XCO2 capability and join TCCON. I thus suggest that the group expand the scope of this investigation to include

processing of their spectra (at least the ones obtained with the CaF2 beamsplitter) using the standard TCCON processing code. Both Hase and Blumenstock run TCCON sites and are thus fully versed in the mechanics of assisting in this extension of scope. Given the clear desire of Baylon et al to join the network, such a modest expansion of scope will thus serve additionally to provide additional knowledge transfer from the KIT group to the Mexico group.

2. Likely not unrelated to 1), the observed diurnal dependence of XCO2 (Fig 10) is almost certainly a result of airmass dependent bias in the retrievals. TCCON processing includes an attempt to account for such bias. Thus, I expect that the TCCON retrievals will substantially reduce the airmass dependence shown in Fig. 10 and additionally alter the seasonal structures (modestly).

Minor comment:

1. Ln 17. Changes in H2O vapor is likely close to changes in CO2 in net change in radiative feedback over past decades.

2. Ln 99. When the KBr UNAO spectra are processed with TCCON software, suggest using same continuum model described by Kiel et al.

3. Ln 185-187 Please explain more fully how the bias (DeltaCO2 = -0.030+- 0.070%) is translated into the scaling factor (0.9986).

4. Ln 200. This is (at best) a hypothesis. Given the (relatively) low biomass in the area, I'm exceedingly doubtful. (see above major comment 2).

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