

Interactive comment on “A new site: ground-based FTIR XCO₂, XCH₄ and XCO measurements at Xianghe, China” by Yang Yang et al.

Anonymous Referee #1

Received and published: 16 December 2019

General comments: The paper describes a new ground-based FTIR measurement site in China, presents a study of greenhouse gases using a ground-based Fourier Transform Infrared Spectrometer of the Bruker IFS 125HR. The measured spectra are analyzed using the GFIT2014 code and the retrieved Xgas are presented. The XCO₂ retrieved from the ground-based FTIR are compared to XCO₂ retrieved from OCO-2, XCH₄ and XCO retrieved from the ground-based FTIR are compared to the XCH₄ and XCO retrieved from TROPOMI satellite observations. However, the description of the paper lacks scientific significance and originality. Also, the time series of target gases cover only one year period, so some discussion and conclusions are not representative.

C1

Specific comments: 1. The aim of the study is to validate satellite data using the FTIR observations, but the paper doesn't describe how to evaluate the accuracy or precision of the FTIR observations. 2. The discussion about day to day variations of Xgas in section 3.3 only use 6-day data, for example in Fig. 10 and 11, so the conclusions about the day to day variation trend of Xgas and the emission source are not reliable and representative. 3. The FTIR measurements need to be very precise and accurate to be useful for satellite validation or model studies, a proper demonstration over a longer period of time is therefore needed for the site. However, the data cover only one year period. 4. In Line 25 Page 11, "The retrieved TROPOMI CO data is in the unit of total column density (molecules/cm²), so we converted them to XCO (ppb) values for comparison with FTIR XCO measurements", there should be a short description of the method and cite a reference. 5. In Line 12 Page 12, "Regular HCl cell measurements show that the ME loss is within 2% and the PE remains within 0.02 rad", the conclusion is not consistent with the ME results in Fig. 2. 6. There are no unit for the mean and std value in the Fig. 12, Fig. 13 and Fig. 14. 7. In Line 14 Page 1, "The rapid economic growth of China has contributed to 30% of the global total carbon dioxide (CO₂) emissions from fossil fuel consumption and cement production (Jackson et al., 2017)", the exact contribution is about 28.5% according to the results in Jackson et al., 2017.

Please also note the supplement to this comment:

<https://www.earth-syst-sci-data-discuss.net/essd-2019-172/essd-2019-172-RC1-supplement.pdf>

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-172>, 2019.

C2