

## ***Interactive comment on “Remotely operable compact instruments for measuring atmospheric CO<sub>2</sub> and CH<sub>4</sub> column densities at surface monitoring sites” by N. Kobayashi et al.***

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Dear Editor: We have revised our MS according to the referee's comments. The revisions we have made in the text are marked by red and given in Supplement. Figure 1 is added and Fig. 4 is revised. Sincerely, Masahiro Kawasaki

Please also note the supplement to this comment:

<http://www.atmos-meas-tech-discuss.net/3/C563/2010/amtd-3-C563-2010-supplement.pdf>

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 1615, 2010.

C563

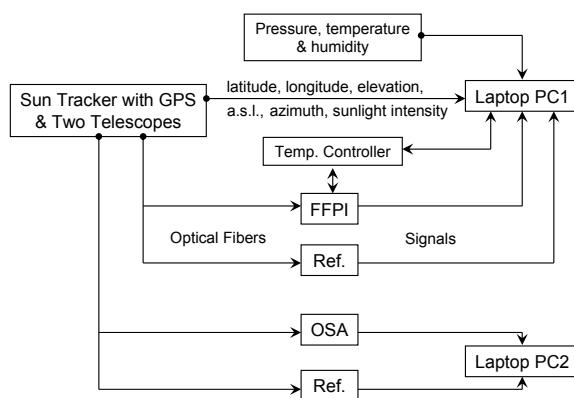


Fig. 1

**Fig. 1.** Block diagram for data acquisition

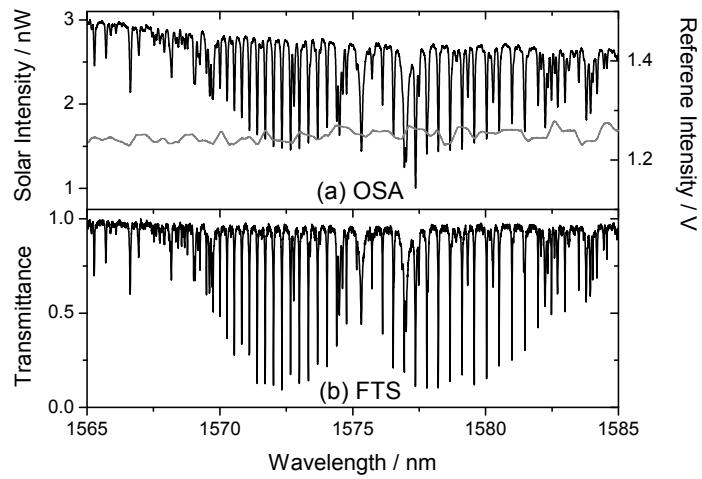


Fig. 2

**Fig. 2.** CO<sub>2</sub> photoabsorption spectra measured by OSA and FTS on 26 August 2009 at Moshiri in Hokkaido, Japan

C565

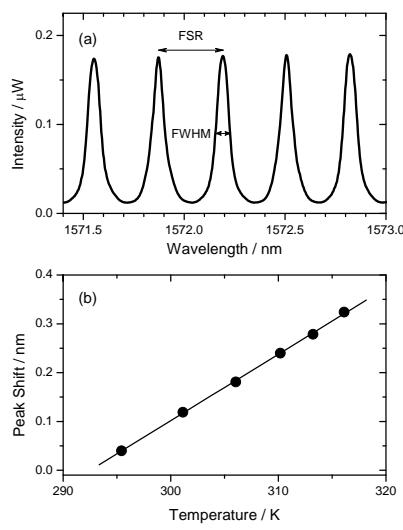


Fig. 3

**Fig. 3.** (a) Free spectral range ( $FSR = 0.317 \pm 0.002$  nm) and full-width at half maximum ( $FWHM = 0.072 \pm 0.002$  nm) of FFPI; (b) Spectral shift of the transmission wavelength by temperature. Temperature coefficie

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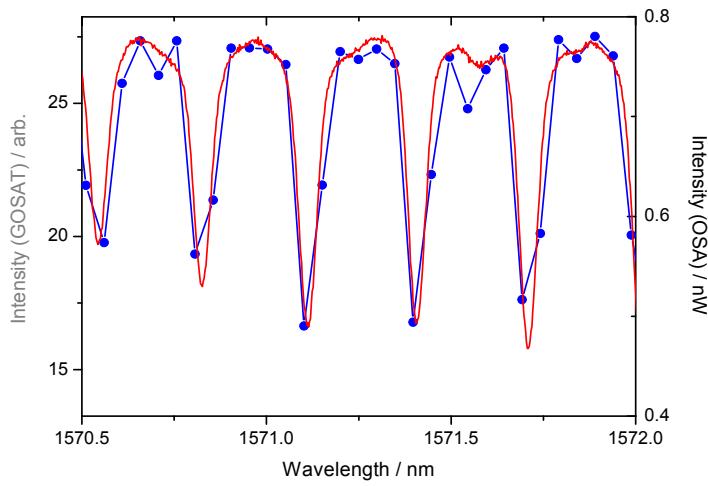


Fig. 4

**Fig. 4.** Parts of CO<sub>2</sub> photoabsorption spectra measured by OSA and FTS onboard GOSAT. OSA: red curve; GOSAT: blue line with dots

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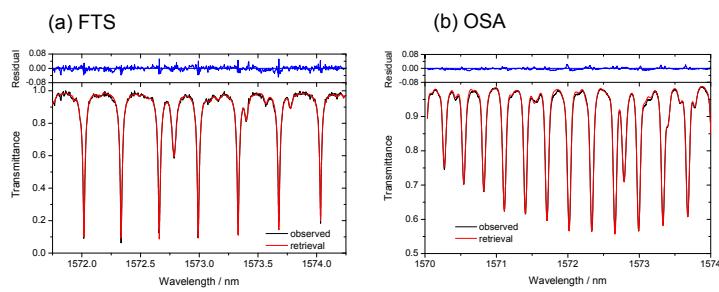


Fig. 5

**Fig. 5.** Enlarged spectra shown in Fig. 2 for the OSA and the FTS after retrievals given in the Appendix section. Black curves denote the observed spectra and red ones for the retrievals

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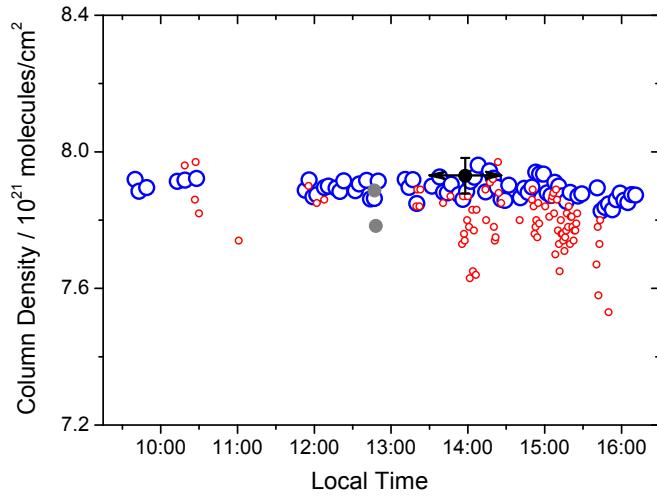


Fig. 6

**Fig. 6.** CO<sub>2</sub> column density profile measured by OSA, FTS, balloon and GOSAT. OSA: large open circles; FTS: small open circles; Balloon: arrows; GOSAT: gray solid circles

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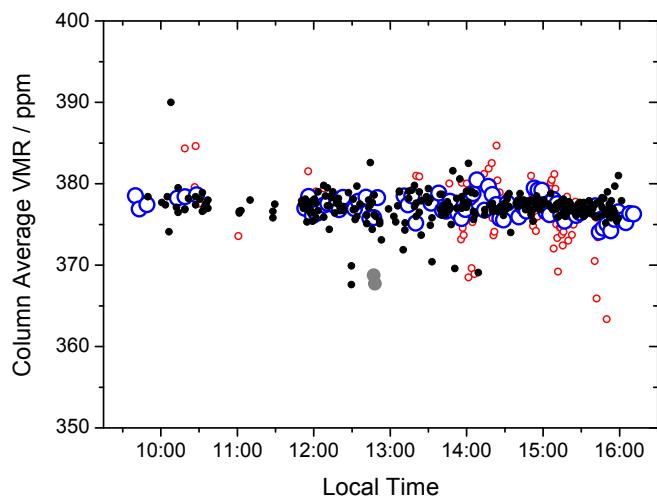


Fig. 7

**Fig. 7.** Column average concentration profile of CO<sub>2</sub>. OSA: large open circles; FTS: small open circles; FTS-GFIT: small solid circles; GOSAT: gray solid circles

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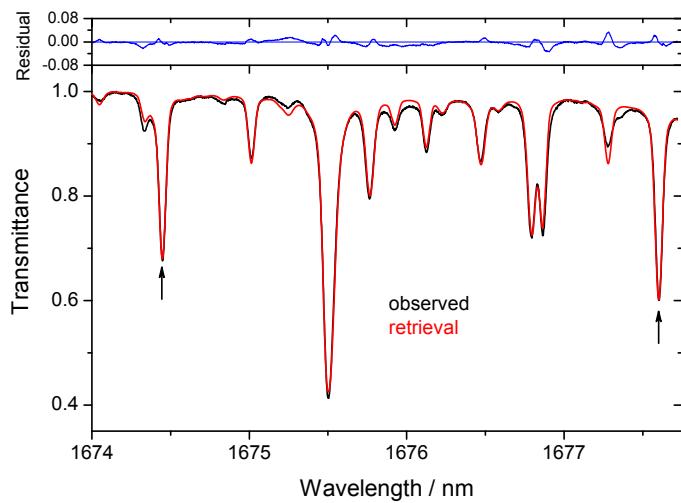


Fig. 8

**Fig. 8.** CH<sub>4</sub> photoabsorption spectrum for OSA retrieval. Black curve denotes the observed spectrum and red one for the retrieval. The arrows are the photoabsorption lines of CH<sub>4</sub>

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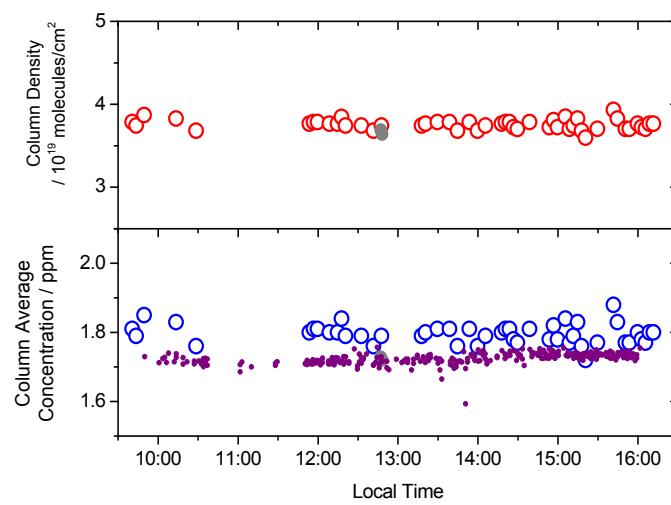


Fig. 9

**Fig. 9.** Column density and column average concentration profiles. OSA: large open circles; FTS-GFIT: small solid circles; GOSAT: gray solid circles

C572

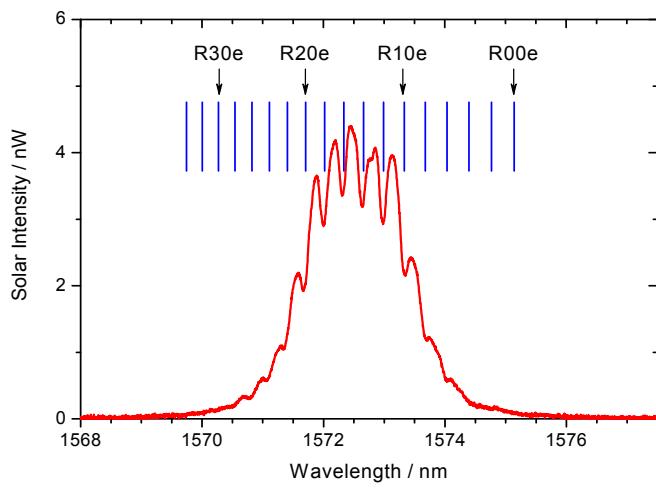


Fig. 10

**Fig. 10.** Spectral profile of the sunlight through a narrow bandpass filter. Assignments for the R-branch in the CO<sub>2</sub> (30012 ← 00001) transition are shown

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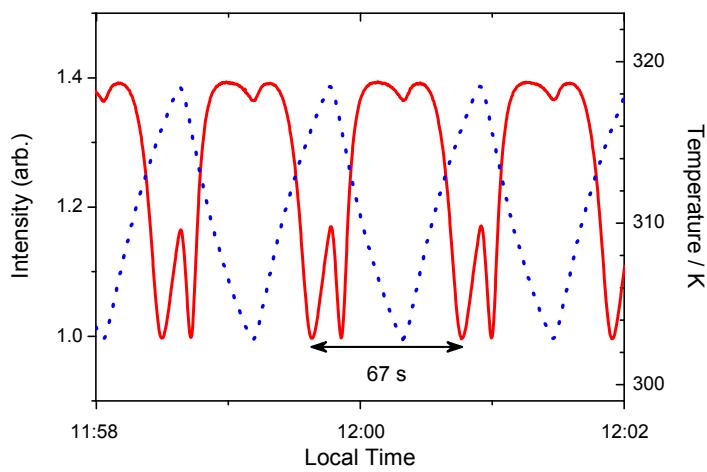


Fig. 11

**Fig. 11.** Signal intensity of the CO<sub>2</sub> photoabsorption (solid curve) measured by modulating the FFPI temperature in a 67 s cycle (dotted curve). The highest value gives the I<sub>0</sub> while the lowest one corresponds to

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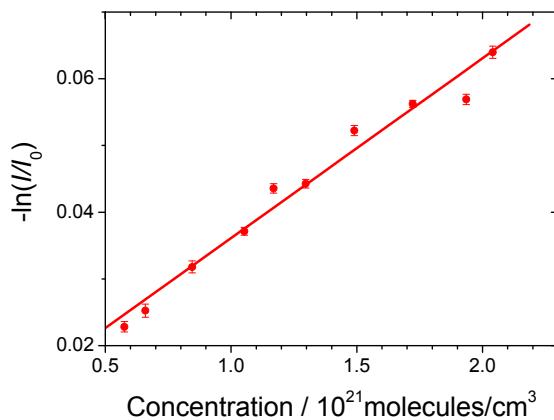


Fig. 12

**Fig. 12.** Absorbance of CO<sub>2</sub> for determination of the effective total photoabsorption cross section measured with neat CO<sub>2</sub> at room temperature in the laboratory

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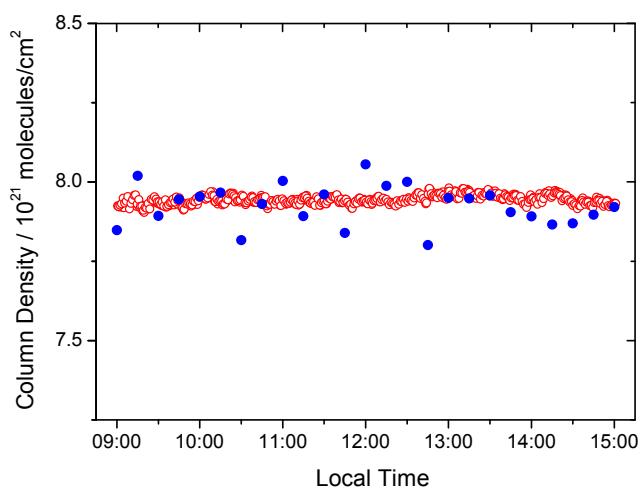


Fig. 13

**Fig. 13.** CO<sub>2</sub> column density measured by FFPI on 31 October 2009 at Katsura Campus of Kyoto University, Kyoto Japan. Open circles are the CO<sub>2</sub> column densities after normalization and the solid circles are those

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