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Temporal variations of the vertical profiles of CH_4 at Tsukuba observed with a Fourier transform spectrometer

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Fourier transform spectrometer (FTS) has advantages in its high resolution and the wide wavenumber range. Vertical profiles of some species can be derived from the high-resolution spectra. The vertical profiles and column densities of CH_4 were retrieved from the solar spectra observed at Tsukuba, Japan with SFIT2 spectral fitting program developed by Rinsland et al. (1998). It needs to select an appropriate wavenumber region and the optimization of fitting parameters is also needed. Now we are investigating these parameters in the NDACC/IRWG group and we will reanalyze the vertical profiles and column densities of CH_4. We found that the seasonal variation of the mixing ratios in the troposphere shows minimum in summer and maximum in winter, indicating that the chemical reaction with OH is main sink. And those in the lower stratosphere shows minimum in spring and maximum in autumn, indicating downward and upward shift due to stratospheric global circulation. The temporal variation of total column shows steplike increase in 2007 from preliminary analysis.

Keywords: FTIR, Trace Species, Methane