

## フーリエ変換型分光器によるつくばにおけるメタン高度分布観測

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The vertical profiles of CH<sub>4</sub> observed at Tsukuba 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<sub>4</sub> were retrieved from the solar spectra observed at Tsukuba, Japan.

CH<sub>4</sub> is relatively stable and second important greenhouse gas. But source intensities and their temporal variations aren't understood well. Therefore, the mechanism of the variation of increasing rate of surface concentration of CH<sub>4</sub> isn't understood too. In the stratosphere, CH<sub>4</sub> is only destructed and finally produce H<sub>2</sub>O. There aren't many observations of temporal variations of stratospheric CH<sub>4</sub> and quantitative understanding isn't sufficient.

Observation at Tsukuba started in 1998 with Bruker 120M. 120HR was used from 2001 and is switched to 125HR from 2010. The resolution of the spectrum is 0.0035 cm<sup>-1</sup>. The retrieval of vertical profiles is performed using the spectra taken with 120HR and 125HR because the optics of our 120M wasn't so good.

The vertical profiles of CH<sub>4</sub> were retrieved with SFIT2 spectral fitting program developed by Rinsland et al. (1998). In the analysis, we have to select an appropriate wavenumber region and the optimization of fitting parameters are also needed. Now we used 2904 cm<sup>-1</sup> region for preliminary analysis. NDACC/IRWG group is investigating the optimization of microwindows and the parameters and we will reanalyze the vertical profiles and column densities of CH<sub>4</sub>.

We found that the phase of seasonal variation of the mixing ratios in the lower stratosphere is shifted from those in the troposphere. The maximum occurred in autumn and the minimum occurred in spring in the stratosphere due to circulation but the maximum occurred in winter and minimum occurred in summer in troposphere due to reaction with OH. The temporal variation of total column shows step-like increase in 2007 as reported by other observations.