

## Validation and temporal variation of vertical profiles of ozone observed with Fourier transform spectrometer

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Vertical profiles of ozone have been observed with a Fourier transform infrared spectrometer (FTIR) at Tukuba. FTIR has advantages in its high resolution and the wide wavenumber range. Vertical profiles of some species can be derived from high-resolution spectra. Chemical changes can be extracted from the correlations of species observed simultaneously. It is important to establish the height retrieval from the spectra.

The FTIR instrument is a Bruker 120HR and its resolution is  $0.0035\text{cm}^{-1}$ . First we retrieved ozone profile because we can validate it with the ozonesonde data at Tukuba.

The vertical profiles of ozone were retrieved from the solar spectra with SFIT2. It needs to select an appropriate wavenumber region that has wide sensitive altitude range, small temperature dependence, and small absorption of interfering species. Optimization of fitting parameters such as a priori profile covariance matrix (Sa) and S/N is also needed.

We already compared 8 wavenumber regions including ozone lines around  $2800 - 3000\text{ cm}^{-1}$  and have found that all regions have nearly same sensitive altitude range but the temperature dependence is small in  $2778.950 - 2779.080\text{ cm}^{-1}$  and  $3051.290 - 3051.900\text{ cm}^{-1}$  regions.

Then, we retrieved ozone profiles with various Sa and S/N values from above two regions and compared with ozonesonde data. Retrieved profiles using Sa=0.20 and S/N=200 from  $3051.290 - 3051.900\text{cm}^{-1}$  are relatively suited to ozonesonde data in the altitude range of 20 - 30 km. We could also retrieve using Sa=0.50 and S/N=1000 from  $2778.950 - 2779.080\text{cm}^{-1}$ , but the temperature dependence of  $2778\text{cm}^{-1}$  region is larger than that of  $3051\text{cm}^{-1}$  region. Therefore, retrieval using Sa=0.20 and S/N=200 from  $3051.290 - 3051.900\text{cm}^{-1}$  is the best for our data.

We will present seasonal variations of vertical ozone profile in 2006 analyzed with these parameters.