

Evolution of HCl and HF above Rikubetsu observed with FTIR between 1995 and 2009

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FTIR(Fourier transform infrared spectrometer) was installed at Rikubetsu (43.5 N, 143.8 E, 370 m a.s.l) located in the northern mid-latitude and infrared solar spectra have been obtained with FTIR since 1995. FTIR enables us to observe several trace gases such as O₃, HF, HCl, and HNO₃ at the same time.

HCl is a reservoir of ozone-depleting substance, chlorine(Cl), and HF is a reservoir of fluorine(F). They are included in the CFCs. Some reports said ozone depletion has slowed down or stopped due to the regulation of emission of CFCs thanks to the Montreal Protocol. To project the variation of ozone in the future, it is important to observe variations of HF and HCl. In addition, it becomes possible to monitor the situation of CFCs emissions. We here report the analytic results for the evolution of total column amounts of HCl and HF.

We used Bruker's IFS-120M FTIR for measurements, and SFIT2 program developed by NIWA, NCAR and Univ. of Wollongong for spectral analysis to deduce column amounts.

We analyzed the data for the period between May 1995 and December 2009.

We also compared our results with the ones at Jungfraujoch (46.5 N, 8.0 E, 3580 m a.s.l.) for the evaluation of total column amounts. Jungfraujoch is also located in the northern mid-latitude and has long-term data derived from FTIR.

We show the evolution of annual average column amounts of HCl and HF in the figure.

It is shown that HCl started to decrease after the peak at around 1995. We don't understand the reason for a tentative large decrease in 1999.

It looks like HF peaked at around 2003, and started to decrease afterwards.

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