

## QUANTITATIVE INFRARED SPECTROSCOPY OF HALOGENATED SPECIES FOR ATMOSPHERIC REMOTE SENSING

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Fluorine- and chlorine-containing molecules in the atmosphere are very strong greenhouse gases, meaning that even small amounts of these gases contribute significantly to the radiative forcing of climate. In addition, a number of these molecules, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), are harmful to the Earth's ozone layer and for this reason their use is regulated by the 1987 Montreal Protocol. The recent Kigali Amendment has added hydrofluorocarbons (HFCs) to the list of controlled substances, coming into effect on 1 January 2019. HFCs, which do not deplete stratospheric ozone, were introduced as refrigerant replacements for CFCs and HCFCs. They are potent greenhouse gases, with global-warming potentials many times greater than carbon dioxide, and are increasing in the atmosphere at a very fast rate.

A number of satellite instruments, in particular the ACE-FTS (Atmospheric Chemistry Experiment – Fourier Transform Spectrometer), can monitor many of these species by detecting infrared radiation that has passed through the Earth's atmosphere. However, the quantification of their atmospheric abundances crucially requires accurate quantitative infrared spectroscopy. This talk will focus on new and improved laboratory spectroscopic measurements for a number of important halogenated species.