



Halogenated source gases measured by FTIR at the Jungfraujoch station: updated trends and new target species

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The atmospheric abundances of chlorine and fluorine increased very significantly during the second half of last century, following large emissions of long-lived halogenated source gases used in numerous industrial and domestic applications. Given the phase-out schedule of ozone depleting substances adopted by the Montreal Protocol, its Amendments and Adjustments, the loading of the CFCs in the Earth's atmosphere is now slowly decreasing. In contrast, their first replacement products, the HCFCs, are still on the rise, with current rates of increase substantially larger than at the beginning of the 21st century. As potent greenhouse gases, a suite of fluorinated compounds are targeted by the Kyoto Protocol. At present, they continue to accumulate in the atmosphere (Montzka et al., 2011).

Given their environmental impacts, continuous monitoring of the abundances of these gases is of primary importance. In addition to the in situ networks, remote sensing techniques operated from space, balloon or from the ground provide valuable information to assess the long-term tropospheric and lower stratospheric trends of an increasing number of halogenated source gases, as well as of the reservoirs resulting from their photolysis in the stratosphere (e.g. Mahieu et al., 2014a).

In this contribution, we will present decadal time series of halogenated source gases monitored at the high altitude station of the Jungfraujoch (46.5°N, 8°E, 3580 m asl) with Fourier Transform Infrared (FTIR) spectrometers, within the framework of the Network for the Detection of Atmospheric Composition Change (NDACC, see <http://www.ndacc.org>). Total column trends presented in previous studies for CFC-11, -12 and HCFC-22 (Zander et al., 2008), CCl₄ (Rinsland et al., 2012), HCFC-142b (Mahieu et al., 2013), CF₄ (Mahieu et al., 2014b) and SF₆ (Zander et al., 2008) will be updated using the latest available Jungfraujoch solar observations. Investigations dealing with the definition of approaches to retrieve additional halogenated source gases from FTIR spectra will also be evoked. Our trend results will be critically discussed and compared with measurements performed in the northern hemisphere by the in situ networks.

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