



Continuous in-situ measurements of atmospheric halocarbons and SF₆ from Shangdianzi station, China

M. K. Vollmer and SOGE-A Team

Empa, Swiss Federal Laboratories for Materials Testing and Research, Section Air Pollution and Environmental Technology, Uberlandstrasse 129, 8600 Dübendorf, Switzerland, Email: martin.vollmer@empa.ch Fax: 0041 44 821 6244

Measurements of a suite of halogenated compounds are conducted at the Chinese Shangdianzi station about 100 km north of Beijing, in order to assess Chinese emissions of several ozone-depleting substances regulated by the Montreal Protocol. The measurements were started in October 2006 and are conducted within the projects SOGE-A (System for Observations of halogenated Greenhouse gases in Europe and Asia) and CMA-CCSF2006-4 (China Meteorological Administration Climate Change Science Foundation) using fully automated in-situ high-precision electron-capture gas-chromatographic measurement techniques. Our timeseries are characterized by sequences of very stable baseline conditions, typically lasting a couple of days, interrupted by pollution events, which last a few hours to a few days. Using backtrajectory analysis we attribute the baseline measurements to air masses arriving from the sparsely populated northwest (Mongolia), while the pollution events are attributed to the southern wind sector including Beijing and other large cities. The strongest pollution event concentrations typically exceed the background concentrations by 30 ppt (6 %) for chlorofluorocarbon-12 (CFC-12), 80 ppt (33 %) for CFC-11, 2.5 ppt (19 %) for methyl chloroform, 9 ppt (150 %) for SF₆, and 190 ppt (1900 %) for chloroform. Our measurements are used together with wind fields and a Lagrangian particle dispersion model to assess regional emissions of these substances. Assuming similar emission patterns for all major Chinese cities, our estimates can then be used as a base for extrapolations to total Chinese emissions of these substances.