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Growth of HFC-143a (CH3CF3) determined from in-situ observation at AGAGE observatories.

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High frequency, in-situ observation from the Advanced Global Atmospheric Gases Experiment (AGAGE) and System for the Observation of Greenhouse Gases in Europe (SOGE) networks for the period 2004 to 2008 have been used to capture the rapid growth of the HFC-143a (CH3CF3) in the atmosphere. These measurements indicate that the atmospheric accumulation has increased considerably since the only other reported measurements by Culbertson et al. (2004) indicated levels of 2ppt in 1997. The growth rate was 1.1 ppt/year (13%/yr) in 2008. The mole fraction in the lower troposphere in 2008 is estimated to be 8.5 ppt. The rapid increase is the effect of the phaseout of the HCFC compounds under the Montreal Protocol and the increased usage of HFC-143a in mixtures for commercial refrigeration as its main application.

The extensive observations have been combined with a range of modelling techniques to derive global and regional emission estimates in a top down approach, which can be compared to bottom up estimates of emissions based on production and consumption data. This independent verification of emissions is vital in assessing the effectiveness of international treaties such as the Kyoto protocol.