First appearance and rapid growth of anthropogenic HFC-245fa (CHF2CH2CF3) in the atmosphere

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We capture the first atmospheric appearance of HFC-245fa (CHF2CH2CF3), a new foam blowing agent. Our results from the high-altitude observatory at Jungfraujoch, Switzerland, show a rapid growth of this substance in the northern hemispheric troposphere from 0.28 ppt in July 2004 to 0.68 ppt at the end of 2005, which corresponds to an overall increase of >90% per year. By combining our observations with an atmospheric 3-box model we estimate a southern hemispheric trend for this trace gas which we compare to observations at southern hemisphere mid-latitudes. We also estimate a global HFC-245fa emissions increase from 2100-2400 tonnes in 2003 to 5100-5900 tonnes in 2005. Pollution episodes are relatively rare at Jungfraujoch compared to other hydrofluorocarbons thereby confirming the limited use of HFC-245fa in Europe. Back trajectory analysis reveals the largest potential European sources of HFC-245fa in northern Italy and northeastern Spain.

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