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## Receptor modeling of C<sub>2</sub>–C<sub>7</sub> hydrocarbon sources at an urban background site in Zurich, Switzerland: changes between 1993–1994 and 2005–2006

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**Abstract.** Hourly measurements of 13 volatile hydrocarbons (C<sub>2</sub>–C<sub>7</sub>) were performed at an urban background site in Zurich (Switzerland) in the years 1993–1994 and again in 2005–2006. For the separation of the volatile organic compounds by gas-chromatography (GC), an identical chromatographic column was used in both campaigns. Changes in hydrocarbon profiles and source strengths were recovered by positive matrix factorization (PMF). Eight and six factors could be related to hydrocarbon sources in 1993–1994 and in 2005–2006, respectively. The modeled source profiles were verified by hydrocarbon profiles reported in the literature. The source strengths were validated by independent measurements, such as inorganic trace gases (NO<sub>x</sub>, CO, SO<sub>2</sub>), methane (CH<sub>4</sub>), oxidized hydrocarbons (OVOCs) and meteorological data (temperature, wind speed etc.). Our analysis suggests that the contribution of most hydrocarbon sources (i.e. road traffic, solvents use and wood burning) decreased by a factor of about two to three between the early 1990s and 2005–2006. On the other hand, hydrocarbon losses from natural gas leakage remained at relatively constant levels (–20%). The estimated emission trends are in line with the results from different receptor-based approaches reported for other European cities. Their differences to national emission inventories are discussed.

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