

## 6.029 Long-term trends of tropospheric ozone precursors at the Czech EMEP and ACTRIS station Kosetice.

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Abstract:

Measurements of tropospheric ozone precursors (volatile organic compounds and nitrogen oxides) at the Kosetice Observatory (Czech Republic) has been implemented since 1993 within EMEP and later ACTRIS (after 2011) monitoring networks. The Observatory (49°35'N, 15°05'E, 534 m a.s.l.), operated by the Czech Hydrometeorological Institute (CHMI), was established in 1988 as a station specialized in air quality monitoring at the background scale. The nonparametric Mann-Kendall method was used for statistical evaluation of volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>) trends significance. In the Czech Republic, NO<sub>x</sub> emissions dropped by 60% in the period 1990-2012 and by 35% after 2000. The figures for VOCs were 68% in the period 1990-2012 and 38% after 2000. Very significant downward trend was found for almost all of measured VOCs with an exception of isoprene, which is controlled first of all by natural conditions and shows different patterns as other VOCs. On contrary, no trend was found by evaluation of NO<sub>x</sub> concentrations in the atmosphere, despite quite significant drop of the nitrogen emissions. The results from the Kosetice Observatory are in very good correspondence with the trends at similarly located stations in the neighbouring countries (Austria, Germany). The reasons are probably the significant changes in the structure of nitrogen emissions. The total NO<sub>x</sub> emissions are negatively affected by a considerable increase in emissions from mobile sources. The share of NO<sub>x</sub> emissions from mobile sources increased from 27.0% in 1990 to 55% by nowadays. The above mentioned trends of tropospheric ozone precursors were reflected in slightly significant downward trend of mean annual tropospheric ozone concentrations. More importantly, the number of episodes with target value for human health exceedances dropped significantly during the period 1993-2015.