



Gas and aerosol composition: simulation and observations by DOAS network in Moscow region

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A DOAS observational network of Obukhov Institute of Atmospheric Physics includes instruments mounted at urban areas of Moscow (2 observational point), Zvenigorod Scientific Station (occasionally polluted area, 35 km to the west from Moscow), Minsk (Belarus) and an instrument used at TROICA train experiments. The instruments are based on image spectrometers detecting scattered in the zenith solar light. JAMSTEC MAX-DOAS spectrometer is collocated with Zvenigorod network instrument. Measurements in UV and visible wavelength make it possible to retrieve integral content of nitrogen dioxide, ozone, formaldehyde and aerosol in the atmospheric boundary layer (ABL).

Integral NO₂ contents in ABL have significant time variation from background value ($5 \cdot 10^{14}$ mol/cm²) to high values of $4 \cdot 10^{17}$ mol/cm². We observed significant daily and weekly variations correlated with traffic jam.

The availability of the observations at urban (Moscow) and background (Zvenigorod) areas allows to compare their contents and to investigate the anthropogenic sources of HCHO.

The NO₂ and HCHO measurements were carried out during forest fires in the hot summer of 2010. The comparison of Moscow region and Minsk (free of fires) data allows investigating the HCHO sources related with forest fires.

Combining the measurements of integral NO₂ in ABL with the EPA ISCST3 air quality model we developed a method for estimation of NO₂ emissions. We estimate that automobiles gave about 90 Mg/year or 65% of total emission.

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