



## **Ground-based measurements of atmospheric trace gases near Saint-Petersburg (Russia)**

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Regular ground-based measurements of characteristics of atmospheric gas composition have been begun at St. Petersburg State University (59°88' N, 29°83' E) since 1990. Equipment and techniques for interpreting the ground-based observations using measurements of spectra of direct solar IR radiation, zenith scattered UV and visible radiation, and thermal microwave radiation in the ozone absorption line are described.

In the report examples of measurements and their analysis are given. Main attention is centered on:

1. Temporal variations of the methane and carbon monoxide total columns including their long-term trends.
2. Temporal variations of NO<sub>2</sub> and O<sub>3</sub> total columns, retrieved from measurements of solar zenith scattered radiation.
3. Results of complex measurements of different atmospheric gases (O<sub>3</sub>, CO<sub>2</sub>, N<sub>2</sub>O, NO<sub>2</sub>, HF, HCl, HNO<sub>3</sub> etc.) by Fourier spectrometer Bruker.
4. Microwave measurements of the ozone total column.
5. Mobile measurements of NO<sub>2</sub> total column.
6. Comparisons of various ground-based methods for measuring the total columns of trace gases.
7. Validation of various satellite measurements of total columns of trace gases.
8. Use of ground-based and satellite measurements of gas total columns for numerical modeling of spatial-temporal variations of tropospheric gas composition.
9. Development of synergetic methods for the ground-based monitoring of the ozone vertical profiles.

The work was supported by the Ministry of Education and Science of Russian Federation in the frame of Federal special-purpose program "Scientific and Educational Manpower of Innovative Russia" (contracts No 969 of 27.05.2010 and No 16.740.11.0048 of 31.08.2010) and by St. Petersburg State University (research projects 11.31.547.2010 and 11.37.28.2011).