

Results of methane concentration measurements in the vicinity of Saint-Petersburg, Russia.

Ivakhov V.*, Privalov V.*, Paramonova N.*, Makarova M., Poberovsky A.****

*Main Geophysical Observatory (MGO)

** Saint-Petersburg State University

The results of methane concentration measurements at Voeikovo station located 20 km East from the Saint-Petersburg center are presented. The semi continuous gas chromatographic measurements at Voeikovo have been conducted since 1996 year. For the period 2008 – 2014 the measurements were carried out with quality control procedures. The error estimation of measurements was done according to recommendations of InGOS project experts. The working standard repeatability and monthly reproducibility are 3.0 ± 0.8 ppb and 0.04 ± 0.25 ppb. The MGO scale consistency to WMO scale is described. Calibration uncertainty is about 1 ppb for the period from 2008 to 2013 and not exceed 0.5 ppb from 2013.

The minimal concentration values at Voeikovo are close to the Mace Hade values. The influence of Saint-Petersburg CH₄ emission is regularly seen and yields concentration exceeding more than 1000 ppb under limitation of the mixing processes in the atmosphere. Simultaneous measurements of CH₄ concentration at Voeikovo and Petergof stations were analyzed. The stations are located 20 km East and 35 km West from Saint-Petersburg center respectively. The measurement complex at Petergof includes CRDS measurements in the atmospheric boundary layer and total column measurements. Analysis indicates that simultaneous measurements at these stations can be used to estimate CH₄ emission from urban zone of Saint-Petersburg.