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Trace Gases and Aerosols in surface Air of polutted and unpolutted Regions of Russia: TROICA Experiments.

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Since 1995 eleven TROICA experiments (Transcontinental Observations Into the Chemistry of the Atmosphere) have been conducted using the mobile railroad laboratory. Nine trips were made along the Trans-Siberian railway from Moscow to Vladivostok, one - in meridional direction between Murmansk and Kislovodsk, and one - around Moscow mega city.

The surface concentrations of trace gases and aerosols, stratospheric abundance of O3 and NO2, natural radioactivity and solar radiation have been measured. The analysis of spacial and temporal variations of measured parameters has been done separately for regions with and without any local atmospheric sources of pollution. The longitudional distribution of long-living species of antropogenic origin displays decline of concentrations eastward under impact of heavy polluted Europe extending up to Eastern Siberia. In summer time Europe's influence on atmospheric chemical composition in Siberia is less evident. O3, CO and VOC concentrations are affected by local processes like oxidation of methane produced by bogs of Western Siberia, forest fires, biomass burning products transport from China.

For last 12 years composition of surface urban year has been considerably changed. Concentration of NOx and of reactive VOC has increased. So has the atmosphere oxidizing ability that resulted in more active ozone generation and in growth of O3 concentration in cities. Plumes of polluted air from cities and separate objects have been defined. In particular, traces from sources along Trans-Siberian railway have

been captured at Zotino Tall Tower Observatory (ZOTTO) in Central Siberia. Typical features of gaseous and aerosol compounds alteration along and across the plumes have been studied. Influence of high-voltage lines on ozone concentration has been evaluated.

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