Joint Russian-Chinese Project "Complex studies of the impact of anthropogenic and wildfire atmospheric emissions on air quality and climate in North Eurasia with use of observational data and numerical modeling of the atmospheric composition"

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Abstract
The project is aimed at comprehensive study of North Eurasia atmospheric composition basing on IAP RAS observation systems in Moscow megapolis, Central Siberia (ZOTTO Tall Tower), as well as across the continent (TROICA). The working activity includes
- Investigation of seasonal and long-term trends and variability of strength of climatically important anthropogenic and wildfire atmospheric emissions in North Eurasia;
- Enhancement of instrument platform and observational systems of the IAP RAS for complex observations of near-surface air composition; conduction of observations;
- Evaluation of relative impact of natural and anthropogenic factors on formation of severe ecological situations in North Eurasia and East Asia;
- Development of methodic and technology to forecast severe ecological situations connected to air pollution by wildfires.

During the project, scientific analyses of the data on near-surface air composition (regional and seasonal scales, urban atmosphere) from observations on atmospheric monitoring stations, including Global Atmospheric Watch observational network, is to be performed.

Qualitative assessment of the influence of biomass burning emissions on near-surface air composition in North Eurasia and East Asia (direct observations and modeling) will be done along with estimations of the ability of various chemical transport models (CMAQ, CAMx) to reproduce surface air chemistry in natural hazards connected to strong air pollution from various natural and anthropogenic sources during severe weather events on the territory of Russia and China for the last decade. Appropriate numerical experiments with realistic scenarios for some regions of Russia and north China will be performed. It is also planned to perform analyses of interconnection between anomalous weather conditions and severe ecological situations based on observations and modeling. Investigations of impact of climatically significant natural and anthropogenic sources of emissions on air quality in highly urbanized areas and mega-polices in Russian Federation and China will be conducted with use of developed emission models and chemical transport models.