



FACULTY OF SCIENCE
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GROUP OF ATMOSPHERIC AEROSOL RESEARCH (GAAR)

OFFER

We are looking for cooperation with academic partners as well as public and private organizations in the fields of aerosol science relating to the actual environmental problems. We offer our high-qualified expertise in the following fields:

- methodology for air pollution source reconnaissance authorized by Ministry of the Environment of the Czech Republic,
- technique of airborne profiling of atmospheric aerosol particles within planetary boundary layer with the stress on chemistry/physics of lower troposphere,
- all together that might serve as the expert opinions and arguments for decision making on different levels of air quality administration.

„Our mission is to get better knowledge of atmospheric aerosol particle distribution within the planetary boundary layer, aerosol properties, behaviour, sources and health impact.“

KNOW-HOW & TECHNOLOGIES

PHYSICAL AND CHEMICAL CHARACTERISTICS OF ATMOSPHERIC AEROSOL

- Vertical/horizontal profiling and sampling of number and mass of size-segregated aerosol particles in planetary boundary layer using an airship.
- Highly time-resolved sampling/elemental composition of size-segregated aerosol particles.
- Aerosol source apportionment based on receptor models.
- Toxicity/genotoxicity of size-segregated aerosol particles.

CONTENT OF RESEARCH

Atmospheric aerosol: size-segregated sampling, on-line physico-chemical characterisation, distribution within planetary boundary layer, aerosol source identification.

MAIN CAPABILITIES

- Field sampling using mobile/stationary container for comprehensive air quality characterisation.
- Vertical/horizontal atmospheric aerosol profiling within planetary boundary layer.
- Air pollution source reconnaissance using advanced receptor models.

KEY RESEARCH EQUIPMENT

- State-of-the-art equipment for atmospheric aerosol physico-chemical characterisation.
- US-EPA approved equipment for aerosol sampling.
- Gondola for air-borne on-line measurements and highly-time sampling of size-segregated atmospheric aerosol particles.
- Resuspension chamber and closed-loop wind tunnel.

MAIN PROJECTS

- Centre of Excellence for Nanoparticle Toxicity, Czech Science Foundation (GAČR P503/12 G147), 2012–2018.
- Highly time- and size-resolved concentrations of atmospheric aerosol and its constituents for the resolution of its sources and genotoxicity, 2008–2011.
- Determination of the concentration of atmospheric aerosol with high temporal resolution in order to estimate its resources and genotoxicity, Ministry of the Environment of the Czech Republic, (SP/1A3/149/08).
- Vertical/horizontal aerosol profiling within atmospheric boundary layer, Grant Agency of Charles University, (GAUK-1354314).

- Contribution of atmospheric aerosol sources to intermodal fraction, Grant Agency of Charles University, (GAUK-242213).
- Methodology of experimental determination of atmospheric aerosol emission power for selected sources (TAČR TH02030238)

PARTNERS AND COLLABORATIONS

- Atmospheric aerosol characteristics from the mining in coal strip mine Vršany and its contribution to PM_{10} in nearby settlement, Czech Coal Group (Vršany uhelná a.s.).
- PM_{10} source reconnaissance in small settlements near coal strip pits mine, CEZ Group (Severočeské doly a.s.).
- Characteristic of highly-time resolved sampling of size-segregated aerosol particles in the city of Plzeň, 2013, Environmental Foundation of the city of Plzeň.
- Highly time-resolved PM_{10} spatial distribution generated by controlled blast, (NINCBP, v.v.i.) The National Institute for Nuclear, Chemical And Biological Protection.
- Deposition velocity determination of aerosol particles in the size of 0.5–1.0 μm onto passive samplers, Occupational Safety Research Institute.
- Spatial and temporal PM_{10} and PM_1 distribution aloft residential area and Škoda Auto company in the city of Mlada Boleslav (Municipality of Mlada Boleslav)

Important cooperations with many academic research groups in the Czech Republic as well as worldwide: Department of Public Health Sciences, University of Rochester Medical Center, Rochester, NY, USA | Air Quality Research Center, University of California, Davis, CA, USA | The Brown Coal Research Institute | j. s. c. | Most, Czech Republic | City administration of Mlada Boleslav

