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Suchánková, Lenka
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Student: Mgr. Lenka Suchánková
Supervisor: Prof. RNDr. Ivan Holoubek, CSc.
Supervising Expert: Ing. Vladimír Ždímal, Dr.

Atmospheric aerosols have a significant impact on the radiative forcing of Earth's climate, directly through the aerosol-radiation interactions (ARIs) i.e., scattering or absorption of incoming solar and outgoing infrared radiation, or indirectly through the aerosol-cloud interactions (ACIs).[1,2] Although there are studies addressing aerosol impact on local climate, [3–5] the information on long-term measurements at rural background site is missing. Such studies are important for understanding of local sources and long-range transport of both anthropogenic and natural aerosols. Therefore, we focused on temporal variations of the total light scattering (σ_{sp}) and backscattering (σ_{bsp}) coefficients and associated optical properties such as the Ångström exponent (*SAE*), backscattering ratio (b), and asymmetry factor (g) at a rural background site National Atmospheric Observatory Košetice (NAOK; 49°34′20.787″N, 15°4′48.155″E′) in Central Europe. We measured σ_{sp} and σ_{bsp} at 5 min resolution at three wavelengths (450, 550, and 700 nm) using the Integrating Nephelometer TSI 3563 (PM10 inlet). Measurements were performed from 16 August 2012 to 31 December 2019. The analysis has been performed using R software version 4.1.0. The preliminary results show that the overall trend for both σ_{sp} and σ_{bsp} is downward from 2012-2019; the slope of the median trend line was –2.50 Mm^{-1}/yr and –0.18 Mm^{-1}/yr at 550 nm, respectively. SO_2 and NO_x concentrations were well correlated with σ_{sp} and σ_{bsp} throughout the period, confirming their contribution in the light-scattering enhancement. b had a positive slope of the median trend line (0.012/yr), indicating more efficient cooling effect alongside lower aerosol loading. Both σ_{sp} and σ_{bsp} reached higher values in the cold seasons (median, 46.8 and 5.9 Mm^{-1}) than in the summer (median, 25.4 and 4.1 Mm^{-1}). This phenomenon is probably related to the higher aerosol loading in winter due to higher energy consumption, poorer dispersion of pollutants, and lower planetary boundary layer. Elevated *SAE* observed in summer indicates smaller particles and corresponds to secondary organic aerosol. On the other hand, decreased SAE during winter corresponds to bigger particles (higher atmospheric stability and thus aerosol aging).

In addition, the sources of scattering aerosols, chemical composition, meteorological conditions, particle size distribution, and radiative forcing will be further investigated at NAOK to better understand the direct effects of aerosols on local climate.

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