Aerosol Particle Formation During Summer Campaign at Rural Background Site Košetice.

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2017

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As a ubiquitous component of the atmosphere, aerosol particles significantly influence atmospheric characteristics. Atmospheric aerosols (AA) affect radiation balance, formation of clouds and precipitation, and visibility. They act either directly due to extinction (scattering and absorption) of incoming solar radiation on aerosol particles, or indirectly serving as cloud condensation nuclei and affecting radiation balance due to scattering the radiation on clouds.[1,2] Both effects depend on AA particles' size and concentration, *i.e.* on particle size distribution. New particle formation (NPF) is a key process of the atmospheric aerosol dynamics influencing particle size distribution; therefore, understanding of NPF is essential for climate studies. NPF events can be observed in many different environments and cover diversity of nucleation mechanisms.[3,4,5,6]

This study of NPF in the atmospheric boundary layer was carried out in summer 2016. The measurement was performed at the National Atmospheric Observatory Košetice (NAO Košetice). This observatory is classified as a background site situated on the NW border of Vysočina region (49° 34′ 24.2″ N, 15° 4′ 49.0″ E, 534 m a. s. l.). The data were collected from 5^{th} August to 30^{th} September 2016 by two state-of-the-art instruments. A Particle Size Magnifier (PSM, model A11, Airmodus) continuously recorded clusters formation in the scanned size range from 1.2 to 3 nm with 4 minutes time resolution, while a Scanning Mobility Particle Sizer (SMPS, IfT TROPOS) monitored aerosol number size distribution in the mobility diameter range from 10 to 800 nm each 5 minutes.

Based on the SMPS data, the individual days were classified as NPF event, non-event and undefined, according to the method of Dal Maso et al. (2005). In order to obtain daily patterns, PSM data were averaged for all NPF event, and all non-event days. Relations between NPF, daily variability of meteorological elements, and aerosol particles precursor concentrations were evaluated.

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