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Long-term study on the impact of new particle formation on CCN in an urban background location

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New Particles Formation (NPF) events and Cloud Condensation Nuclei (CCN) have been investigated intensively over the last years. Measurements have been performed at many different locations.
Several studies suggest that NPF significantly enhance atmospheric CCN concentrations. Only few studies, however, linked nucleation measurements directly to increases in measured CCN concentrations. Most of these studies were performed in remote or background locations. There is a lack of continuous long-term measurements of CCN concentrations in the urban background.
In order to provide more information about NPF acting as a source of CCN, a long term study was started in June 2014 in the urban background of Vienna and is planned to continue for the foreseeable future. The measurements are performed at the aerosol laboratory located on the rooftop (35m above ground) of the Physics building of the University of Vienna, located in central Vienna. Concentrations as well as seasonal characteristics of CCN concentrations and NPF events will be investigated.
A CCNC (Cloud Condensation Nuclei Counter) designed at the University of Vienna operating on the principle of a static thermal diffusion chamber (Giebl et al., 2002), is used to measure CCN concentrations and activation ratios for low supersaturations (0,5%). NPF events are determined with a Vienna-type DMPS (Differential Mobility Particle Sizer, Winkelmayr et al., 1991) and classified using the criteria of Dal Maso et al., (2005).
NPF events cannot always be identified completely clearly because of local pollution plumes. Traffic emissions could additionally increase the concentration of organic particles during a NPF event. A Multi Angle Absorption Photometer (MAAP) measuring black carbon concentration is therefore used to monitor the contribution of traffic emissions to the aerosol at the station.