



## Seasonal variability of ice nuclei over Central Europe

Holger Klein (1), Slobodan Nickovic (2), Lothar Schuetz (3), Stephan Weinbruch (4), Zev Levin (5), Meinrat Andreae (6), Leonard Barrie (2), Martin Ebert (4), Ulrich Bundke (1), Heinz Bingemer (1), and the FRIDGE Team

(1) Institute for Atmospheric and Environmental Sciences, Goethe-University, Frankfurt / Main, Germany, (2) World Meteorological Organization, Geneva, Switzerland, (3) Institute for Atmospheric Physics, Gutenberg-University, Mainz, Germany, (4) Institute for Environmental Mineralogy, TU Darmstadt, Germany, (5) Dept. of Geophysics and Planetary Science, Tel Aviv University, Tel Aviv, Israel, (6) Biogeochemistry Dept., Max-Planck-Institute for Chemistry, Mainz, Germany

The abundance of ice nuclei (IN) has been measured every day since April 2008 at the Taunus Observatory on Mt. Kleiner Feldberg (50.22°N, 8.45°E, 825 m. above sea level) at 20 km north of Frankfurt / M., Germany. Aerosol samples were collected on silicon wafers by an electrical aerosol precipitator and analyzed for IN number concentration (condensation and deposition freezing modes) using the static vapor diffusion chamber FRIDGE (Klein et al., *Atmos. Res.*, doi:10.1016/j.atmosres.2009.08.002, 2009). Around 800 samples were analyzed so far. The IN number concentration shows a pronounced seasonal signal with about a factor of 10 higher ice nuclei in summer than in winter. Desert dust transported over long distances appears to be the dominant contributor to IN at the site. Episodes of Sahara dust transport are well represented by individual peaks in the IN record and identified by airmass trajectories, transport modelling and mineralogical analysis.

The contribution of mineral dust to IN is further corroborated by the covariance of the individual IN concentrations with the aerosol optical depth (AOD) due to extinction by large particles, which was measured simultaneously at the AERONET site (Max-Planck-Institute for Chemistry) at Mainz, 20 km southwest of our site.

The relation between IN and AOD not only holds for our individual daily measurements, but is also valid for the monthly means of our IN record, which are highly correlated to the multi-year monthly means of coarse and middle-sized dust AOD which is derived from the Multi-angle Imaging SpectroRadiometer (MISR) satellite instrument ([http://eosweb.larc.nasa.gov/cgi-bin/misr\\_tools/clim\\_likely.cgi](http://eosweb.larc.nasa.gov/cgi-bin/misr_tools/clim_likely.cgi)) for the grid point closest to our site.

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