

## X-ray scattering methods for ice formation on solid surfaces

*Thursday 14 November 2024 09:20 (20 minutes)*

Aerosol particles, in particular mineral dust, play an important role in the condensation of cloud droplets and formation of ice crystals. Airborne mineral dust consists mainly of clay minerals (~60%), quartz (~25%), and feldspar (~12 %). The comparatively low fraction of feldspar dominates the ice nucleation. Recently, A. Kiselev et al. revealed oriented ice growth on several feldspar surfaces. The ice nucleation seems to be affected by specific nucleation sites (steps, cracks, dissolution lamellae). Thus, ice nucleation on solid surfaces becomes a classical surface-science question and can be tackled with established synchrotron methods such as grazing-incidence scattering techniques (GID, XRR, CTR-Measurements...). These techniques have significantly evolved with the developments of synchrotron sources, beamline optics, and detectors, opening new opportunities for atmospheric research. In this presentation, the possibilities and the complexity of surface science experiments during water condensation and ice nucleation on natural crystals will be discussed. Some aspects will be demonstrated using in situ data obtained with a newly developed environmental cell at the KIT light source (MPI-beamline) and Petra III (P08).

### Significance

**Presenter:** KRAUSE, Bärbel (KIT)

**Session Classification:** Solids and solid interfaces