

Publication

Ice Nucleating Particle Measurements at 241 K during Winter Months at 3580m MSL in the Swiss Alps

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4519767**Author(s)** Boose, Yvonne; Kanji, Zamin A.; Kohn, Monika; Sierau, Berko; Zipori, Assaf; Crawford, Ian; Lloyd, Gary; Bukowiecki, Nicolas; Herrmann, Erik; Kupiszewski, Piotr; Steinbacher, Martin; Lohmann, Ulrike**Author(s) at UniBasel** [Bukowiecki, Nicolas](#) ;**Year** 2016**Title** Ice Nucleating Particle Measurements at 241 K during Winter Months at 3580m MSL in the Swiss Alps**Journal** JOURNAL OF THE ATMOSPHERIC SCIENCES**Volume** 73**Number** 5**Pages / Article-Number** 2203-2228**Mesh terms** Science & TechnologyPhysical SciencesMeteorology & Atmospheric SciencesMeteorology & Atmospheric Sciences

Ice nucleating particle (INP) concentrations were measured at the High Altitude Research Station Jungfraujoch, Switzerland, 3580 m above mean sea level during the winter months of 2012, 2013, and 2014 with the Portable Ice Nucleation Chamber (PINC). During the measurement periods, the research station was mostly located in the free troposphere, and particle concentrations were low. At temperature $T = 241$ K, INP concentrations in the deposition regime [relative humidity with respect to water (RH_w) = 93%] were, on average, below 1.09 per standard liter of air (stdL(-1); normalized to 1013 hPa and 273 K) and 4.7 ± 6.3 stdL(-1) in the condensation regime (RH_w = 103%) in winter 2014. The deployment of a particle concentrator upstream of PINC decreased the limit of detection (LOD) by a factor of 3 compared to earlier measurements. The authors discuss a potential bias of INP measurements toward higher concentrations if data below the LOD are disregarded and thus recommend reporting subLOD data in future publications. Saharan dust and more local, basaltic dust mixed with marine aerosol were found to constitute the dominant INP type. Bioaerosols were not observed to play a role in ice nucleation during winter because of their low concentration during this period. The INP concentrations at Jungfraujoch are low in comparison to other studies of INP at this temperature. This represents the first study addressing interannual variations of INP concentrations during winter at one location.

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