

Publication

Aerosol decadal trends - Part 2: In-situ aerosol particle number concentrations at GAW and ACTRIS stations

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4519784**Author(s)** Asmi, A.; Coen, M. Collaud; Ogren, J. A.; Andrews, E.; Sheridan, P.; Jefferson, A.; Weingartner, E.; Baltensperger, U.; Bukowiecki, N.; Lihavainen, H.; Kivekäs, N.; Asmi, E.; Aalto, P. P.; Kulmala, M.; Wiedensohler, A.; Birmili, W.; Hamed, A.; O'Dowd, C.; Jennings, S. G.; Weller, R.; Flentje, H.; Fjaeraa, A. M.; Fiebig, M.; Myhre, C. L.; Hallar, A. G.; Swietlicki, E.; Kristensson, A.; Laj, P.**Author(s) at UniBasel** [Bukowiecki, Nicolas](#) ;**Year** 2013**Title** Aerosol decadal trends - Part 2: In-situ aerosol particle number concentrations at GAW and ACTRIS stations**Journal** Atmospheric Chemistry and Physics**Volume** 13**Number** 2**Pages / Article-Number** 895-916**Mesh terms** Science & TechnologyLife Sciences & BiomedicinePhysical SciencesEnvironmental SciencesMeteorology & Atmospheric SciencesEnvironmental Sciences & EcologyMeteorology & Atmospheric Sciences

We have analysed the trends of total aerosol particle number concentrations (N) measured at long-term measurement stations involved either in the Global Atmosphere Watch (GAW) and/or EU infrastructure project ACTRIS. The sites are located in Europe, North America, Antarctica, and on Pacific Ocean islands. The majority of the sites showed clear decreasing trends both in the full-length time series, and in the intra-site comparison period of 2001-2010, especially during the winter months. Several potential driving processes for the observed trends were studied, and even though there are some similarities between N trends and air temperature changes, the most likely cause of many northern hemisphere trends was found to be decreases in the anthropogenic emissions of primary particles, SO₂ or some co-emitted species. We could not find a consistent agreement between the trends of N and particle optical properties in the few stations with long time series of all of these properties. The trends of N and the proxies for cloud condensation nuclei (CCN) were generally consistent in the few European stations where the measurements were available. This work provides a useful comparison analysis for modelling studies of trends in aerosol number concentrations.

Publisher European Geosciences Union**ISSN/ISBN** 1680-7316 ; 1680-7324**edoc-URL** <https://edoc.unibas.ch/74005/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.5194/acp-13-895-2013**ISI-Number** 000314172200025**Document type (ISI)** Article