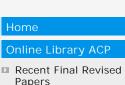
Atmospheric Chemistry and Physics

| Copernicus.org | EGU.eu |

An Interactive Open Access Journal of the European Geosciences Union



- Volumes and Issues
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

- Alerts & RSS Feeds
- **General Information**

Submission

Review

Production

Subscription

Comment on a Paper





Volumes and Issues
 Contents of Issue 2
 Special Issue
 Atmos. Chem. Phys., 7, 355-376, 2007
 www.atmos-chem-phys.net/7/355/2007/
 Author(s) 2007. This work is licensed
 under a Creative Commons License.

Nucleation and growth of new particles in Po Valley, Italy

A. Hamed¹, J. Joutsensaari², S. Mikkonen¹, L. Sogacheva³,
M. Dal Maso³, M. Kulmala³, F. Cavalli⁴, S. Fuzzi⁴, M. C. Facchini⁴,
S. Decesari⁴, M. Mircea⁴, K. E. J. Lehtinen⁵, and A. Laaksonen^{1,6}
¹Department of Physics, University of Kuopio, P.O. Box 1627, 70211 Kuopio,
²Department of Environmental Sciences, University of Kuopio, P.O. Box 1627, 70211 Kuopio,
70211 Kuopio, Finland

³Division of Atmospheric Sciences, Department of Physical Sciences, P.O. Box 64, 00014, University of Helsinki, Finland

⁴Inst. di Scienze dell'Atmosfera e del Clima – CNR, Italy Via Gobetti 101, 40 129 Bologna, Italy

⁵Finnish Meteorological Institute, Kuopio Unit, P.O. Box 1627, 70210 Kuopio, Finland

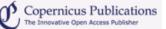
⁶Finnish Meteorological Institute, P.O. Box 503, 00101 Helsinki, Finland

Abstract. Aerosol number distribution measurements are reported at San Pietro Capofiume (SPC) station (44°39' N, 11°37' E) for the time period 2002-2005. The station is located in Po Valley, the largest industrial, trading and agricultural area in Italy with a high population density. New particle formation was studied based on observations of the particle size distribution, meteorological and gas phase parameters. The nucleation events were classified according to the event clarity based on the particle number concentrations, and the particle formation and growth rates. Out of a total of 769 operational days from 2002 to 2005 clear events were detected on 36% of the days whilst 33% are clearly non-event days. The event frequency was high during spring and summer months with maximum values in May and July, whereas lower frequency was observed in winter and autumn months. The average particle formation and growth rates were estimated as $\sim 6 \text{ cm}^{-3} \text{ s}^{-1}$ and $\sim 7 \text{ nm} \text{ h}^{-1}$, respectively. Such high growth and formation rates are typical for polluted areas. Temperature, wind speed, solar radiation, SO2 and O3 concentrations were on average higher on nucleation days than on non-event days, whereas relative and absolute humidity and NO2 concentration were lower; however, seasonal differences were observed. Backtrajectory analysis suggests that during majority of nucleation event days, the air masses originate from northern to eastern directions. We also study previously developed nucleation event correlations with environmental variables and show that they predict Po Valley nucleation events with variable success.

■ Final Revised Paper (PDF, 2483 KB) ■ Discussion Paper (ACPD)

Citation: Hamed, A., Joutsensaari, J., Mikkonen, S., Sogacheva, L., Dal Maso, M., Kulmala, M., Cavalli, F., Fuzzi, S., Facchini, M. C., Decesari, S., Mircea, M., Lehtinen, K. E. J., and Laaksonen, A.: Nucleation and growth of new particles in Po Valley, Italy, Atmos. Chem. Phys., 7, 355-376,

| EGU Journals | Contact



Search ACP	
Library Search	•
Author Search	•

News

- Sister Journals AMT & GMD
- Financial Support for Authors
- Journal Impact Factor
- Public Relations & Background Information

Recent Papers

01 | ACPD, 28 Nov 2008: Estimating surface CO_2 fluxes from space-borne CO_2 dry air mole fraction observations using an ensemble Kalman Filter

02 | ACPD, 28 Nov 2008: Comparison of tropospheric chemistry schemes for use within global models

 $03 \mid ACP, 28 \ Nov 2008:$ Measurements of HNO_3 and N_2O_5 using ion drift-chemical ionization mass spectrometry during the MILAGRO/MCMA-2006 campaign

2007.
Bibtex EndNote Reference Manager