

[Home](#)[Online Library ACP](#)[Recent Final Revised Papers](#)[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](#)

Impact  
Factor  
4.865

ISI  
indexed

[Volumes and Issues](#) [Contents of Issue 12](#) [Special Issue](#)

Atmos. Chem. Phys., 6, 5549-5557, 2006

[www.atmos-chem-phys.net/6/5549/2006/](http://www.atmos-chem-phys.net/6/5549/2006/)

© Author(s) 2006. This work is licensed under a Creative Commons License.

## Using discriminant analysis as a nucleation event classification method

S. Mikkonen<sup>1</sup>, K. E. J. Lehtinen<sup>1,2</sup>, A. Hamed<sup>1</sup>, J. Joutsensaari<sup>3</sup>, M. C. Facchini<sup>4</sup>, and A. Laaksonen<sup>1</sup>

<sup>1</sup>Department of Physics, University of Kuopio, P.O. Box 1627, 70211 Kuopio, Finland

<sup>2</sup>Finnish meteorological institute, Kuopio Unit, P.O. Box 1627, 70210 Kuopio, Finland

<sup>3</sup>Department of Environmental Sciences, University of Kuopio, P.O. Box 1627, 70211 Kuopio, Finland

<sup>4</sup>Istituto di Scienze dell'Atmosfera e del Clima – CNR, Italy Via Gobetti 101, 40 129 Bologna, Italy

**Abstract.** More than three years of measurements of aerosol size-distribution and different gas and meteorological parameters made in Po Valley, Italy were analysed for this study to examine which of the meteorological and trace gas variables effect on the emergence of nucleation events. As the analysis method, we used discriminant analysis with non-parametric Epanechnikov kernel, included in non-parametric density estimation method. The best classification result in our data was reached with the combination of relative humidity, ozone concentration and a third degree polynomial of radiation. RH appeared to have a preventing effect on the new particle formation whereas the effects of O<sub>3</sub> and radiation were more conductive. The concentration of SO<sub>2</sub> and NO<sub>2</sub> also appeared to have significant effect on the emergence of nucleation events but because of the great amount of missing observations, we had to exclude them from the final analysis.

[Final Revised Paper](#) (PDF, 3295 KB) [Discussion Paper](#) (ACPD)

Citation: Mikkonen, S., Lehtinen, K. E. J., Hamed, A., Joutsensaari, J., Facchini, M. C., and Laaksonen, A.: Using discriminant analysis as a nucleation event classification method, Atmos. Chem. Phys., 6, 5549-5557, 2006. [Bibtex](#) [EndNote](#) [Reference Manager](#)

[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 | ACP, 22 Jan 2009:  
Assessing positive matrix factorization model fit: a new method to estimate uncertainty and bias in factor contributions at the measurement time scale

02 | ACPD, 22 Jan 2009:  
Influence of semi-volatile species on particle hygroscopic growth

03 | ACPD, 22 Jan 2009:  
Evaluation of CLaMS, KASIMA and ECHAM5/MESy1 simulations in the lower stratosphere using observations of Odin/SMR