

Conference or Workshop Item (Poster)

Aas, W.; Alfarra, R.; Bieber, E.; Ceburnis, D.; Ellermann, T.; Ferm, M.; Frohlich, M.; Gehrig, R.; Hansson, H. C.; Kiss, G.; Makkonen, U.; Mihalopoulos, N.; Nemitz, E.; Otjes, R.; Perez, N.; Perrino, C.; Putaud, J. P.; Spindler, G.; Tsyro, S.; Vana, M.; Yttri, K. E.. 2007 Intensive Measurements and modeling of size segregated chemical composition of aerosols in June 2006 and January 2007 in EMEP. [Poster] In: *European Aerosol Conference 2007, Salzburg, 9-14 Sept 2007*. European Aerosol Association.

This version available at <http://nora.nerc.ac.uk/2476/>

NERC has developed NORA to enable users to access research outputs wholly or partially funded by NERC. Copyright and other rights for material on this site are retained by the authors and/or other rights owners. Users should read the terms and conditions of use of this material at <http://nora.nerc.ac.uk/policies.html#access>

Contact CEH NORA team at
nora@ceh.ac.uk

Intensive measurements and modelling of size segregated chemical composition of aerosols in June 2006 and January 2007 in EMEP

W. Aas¹, M.R. Alfarra², E. Bieber³, D. Ceburnis⁴, T. Ellermann⁵, M. Ferm⁶, M. Frölich⁷, R. Gehrig⁸, H.C. Hansson⁹, G. Kiss¹⁰, U. Makkonen¹¹, N. Mihalopoulos¹², E. Nemitz¹³, R. Otjes¹⁴, N. Perez¹⁵, C. Perrino¹⁶, J.P. Putaud¹⁷, G. Spindler¹⁸, S. Tsyro¹⁹, M. Vana²⁰, K.E. Yttri¹

¹Norwegian Institute for Air Research (NILU), Box 100 2027 Kjeller, Norway, waa@nilu.no

²Paul Scherrer Institute (PSI), Villigen, Switzerland

³Umweltbundesamt, Dessau, Germany

⁴National University of Ireland, Galway, Ireland

⁵National Environmental Research Institute (NERI), Roskilde, Denmark

⁶Swedish Environmental Research Institute (IVL), Gothenburg, Sweden

⁷Umweltbundesamt, Vienna, Austria

⁸Air Pollution, Environmental Technology EMPA, Dübendorf, Switzerland

⁹The Department of Applied Environmental Science (ITM), Stockholm University, Sweden

¹⁰University of Veszprém, Veszprem, Hungary

¹¹Finnish Meteorological Institute (FMI), Helsinki, Finland

¹²University of Crete, Heraklion, Greece

¹³Centre for Ecology and Hydrology (CEH) Edinburgh, UK

¹⁴Energy Centre of the Netherlands (ECN), Petten, Netherlands

¹⁵The Institute of Earth Sciences Jaume Almera (ICTJA-CSIC)

¹⁶CNR, The Institute for Atmospheric Pollution, Italy

¹⁷European Commission – DG Joint Research Centre, Ispra, Italy

¹⁸Leibniz Institute for Tropospheric Research (IFT) Leipzig, Germany

¹⁹Norwegian Meteorological Institute, Oslo, Norway

²⁰The Czech Hydrometeorological Institute (CHMI), Prague, Czech Republic

Keywords: ambient aerosols, chemical composition, long-range transport, number size distribution

In the EMEP Monitoring Strategy (EB.AIR/GE.1/2004/5) it is stated that advanced aerosol measurements at super sites (Level 2 and 3) should be included as a regular part of the monitoring programme in Europe. It is however not realistic to require full daily chemical speciation or continuous measurements 365 days a year. Coordinated intensive measurements have therefore been recommended, and the first sampling periods were set for June 2006 and January 2007. The main focus was on size-resolved chemical speciation (i.e. PM₁₀, PM_{2.5} and PM₁) and the gas/aerosol partitioning of inorganic aerosol. In addition, number size distribution was measured at several sites. Both continuous and manual measurements were used. In table 1 there is an overview of what have been measured.

These new data are very valuable for further EMEP model verification. The measurements have been compared with calculations from the EMEP Unified model, facilitating evaluation of the model performance with respect to PM size distribution and chemical speciation.

The results show clear regional differences. In the Nordic countries the average PM₁ mass as well as the chemical composition is very similar as to that of PM_{2.5} in summer. While in central and southern Europe the ration varies more from day to day, dependent on source areas. For the

intensive hourly measurements there is a distinct difference between the nitrogen rich air in NL compared with the other sites.

Table 1. Measurement programme.

Sites	Mass	D	I	O	M	C	I
		I	N	R	T	R	N
		S	O	G	A	A	
		T	R		L	S	
			G			T	
AT02	PM10,PM2.5,PM1		X	X			
CH02	PM10,PM2.5,PM1	X	X	X			X
CZ03	PM10,PM2.5			X	X		
DK41	PM10,PM2.5, PM1			Element anal.			
DE02	PM10,PM2.5,PM1						
DE03	PM10, PM2.5	X					
DE07	PM10,PM2.5				X		
DE44	PM10,PM2.5,PM1	X	X	X			X
ES31	PM10,PM2.5, PM1		X	X	X	X	
FI17	PM10,PM2.5,PM1		X				
HU02	PM10			X			
IE31	PM10,PM2.5,PM1	X	X	X			X
IT01	PM10,PM2.5	X	X	X		X	
IT04	PM10,PM2.5	X	X	X			X
NL11							X
NO01	PM10,PM2.5,PM1	X	X	X			
SE12	PM10,PM2.5,PM1	X		X			
GR02	PM10		X	X			
GB36							X
GB40							X

* DIST means number size distribution while INTEN means continuous measurements using the AMS or MARGA/GRAEGOR systems. Some measurements were only done in one period. ORG may be either or both EC and OC.