

International workshop on assessing fine-granular modelling and measurement of particulate matter

04 – 05 Dezember 2018

Helmholtz Zentrum München

Ingolstädter Landstraße 1, 85764 Neuherberg/Oberschleißheim

Building 3531, Room 1050

(organized by the Smart Air Quality Network project funded by the German Federal Ministry of Transport and Digital Infrastructure (BMVI) under grant no. 19F2003B)

It is the mid-term meeting of the project also and we want

- to discuss the very first project results,
- to compare these results with the project programme,
- to correlate our project with similar projects worldwide and
- to draw conclusions to improve the project program for the second half of the project.

Further, we like to discuss new working ideas and research initiatives resulting in concepts of future cooperation and joint research proposals for financial support.

04/12/2018 Day 1: Air Quality Networks and Measurements

10:30 Arrival & Registration

11:00 Welcome

Till Riedel, project coordinator, Karlsruhe Institute of Technology
Josef Cyrus, local host, Helmholtz Zentrum München

11:10 Short introduction of all participants

11:30 Presentation of the **Smart Air Quality Network project** (oral)

Introductory Keynote

Till Riedel, Karlsruhe Institute of Technology

Survey of the small-scale variability of aerosols and validation of low-cost sensors by mobile measurements

Jan Bendl, Mohamed Khedr, Xiansheng Liu, Jürgen Schnelle-Kreis, Helmholtz Zentrum München

Low-Cost Sensing and Data Management in SmartAQnet

Matthias Budde, Karlsruhe Institute of Technology

Requirements for a Smart Indicative Ambient Particulate Monitor (SIAPM)

Markus Pesch, GRIMM Aerosol Technik Ainring GmbH & Co.KG

Mobile measurements and applications of smart air quality networks

Andreas Philipp, Erik Petersen, Johanna Redelstein, University of Augsburg

Temporal and geographical contrasts in pollutant exposures - implications for epidemiological research

Josef Cyrus, Helmholtz Zentrum München

First SmartAQnet results from accompanying air quality modelling

Ulrich Uhrner, Rafael Reifeltshammer, Peter Sturm, Technical University Graz; Johannes Werhahn, Renate Forkel, Stefan Emeis, Karlsruhe Institute of Technology; Klaus Schäfer, Atmospheric Physics Consultant; Erik Petersen, Andreas Philipp, University of Augsburg; Robert Kunde, ZAE Bayern

12:40 **Questions and comments** to the Smart Air Quality Network project presentation

13:00 Lunch

14:00 Session on **Concepts of smart air quality networks**

Moderation: *Josef Cyrus, Helmholtz Zentrum München; Ling-Jyh Chen, Academia Sinica*

Airbox: A Participatory Ecosystem for PM_{2.5} Monitoring (oral)

Ling-Jyh Chen

Academia Sinica, Teipei, Taiwan

AirScan: A Distributed, Low-Cost Measurement Network for PM, NO₂ and O₃ - First Results and Evaluation with Respect to the German 39th BImSchV (oral)

Johannes Langer, Birgit Fullerton, Matthew Fullerton

Hawa Dawa GmbH, Munich, Germany

Estimation of Equivalent Black Carbon Spatial Distribution in WTimpact (Poster)

Liina Tonisson, Oswald Knoth, Thomas Müller

Leibniz Institute for Tropospheric Research, Leipzig, Germany

Combining satellite and ground based remote sensing measurements with in-situ sensor network to derive spatial distribution of pollutants (oral)

Ka Lok Chan, Pieter Valks

Remote Sensing Technology Institute (IMF), German Aerospace Center (DLR), Oberpfaffenhofen, Germany

14:45 Session on **Measurement techniques for smart air quality networks**

Moderation: *Volker Ziegler, GRIMM Aerosol Technik Ainring GmbH & Co.KG; Youhui Xiong, Wuhan Cubic Optoelectronics Co. Ltd*

Field Deployment Experience of Low-Cost Smart City Air Pollution Monitoring Network (oral)

Seng-Yong Lau¹, Yu-Ting Chen¹, Chai-Pei Chen², Yeuh-Bin Wang², Shuenn-Chin Chang², Lung-Chi Lin¹, Chih-Ming Pao¹

¹ EnSense Co., Ltd., New Taipei City, Taiwan, ² Department of Environmental Monitoring & Information Management, Environmental Protection Administration, Teipei, Taiwan

Testing and Inter-comparison of Low-Cost Sensors (SDS 011) and Mid-Cost Sensors (AN2 and AN3) for Particulate Matter (oral)

Konradin Weber

Duesseldorf University of Applied Sciences (HSD), Duesseldorf, Germany

Differential Column Sensor Network in Munich and Low-Cost NO_x Sensor Development (oral)

Jia Chen

Technical University of Munich, Department of Electrical and Computer Engineering, Munich, Germany

Investigation of Low-Cost-Dryer Installed on the Low-Cost-Sensors used for Measuring the Particulate Matter in the Ambient Air (oral)

Ulrich Vogt, Abdul Samad, Bernd Laquai

University of Stuttgart, Institute for Combustion and Power Plant Technology - IFK, Stuttgart, Germany

The developing of an economic laser particulate matter sensor for outdoor air quality network application (oral)

Youhui Xiong, Tao He, Zhiqiang Liu

Wuhan Cubic Optoelectronics Co., Ltd, Wuhan, China

Measurements of horizontal and vertical variability of atmosphere pollutants using a combination of small-scale sensors and remote sensing techniques (oral)

Mark Wenig, Ye Sheng

Ludwig Maximilian University Munich, Munich, Germany

16:15 Coffee break

16:30 Session on **Data management systems**

Moderation: *Matthias Budde, Karlsruhe Institute of Technology;*

Nicolas Moussiopoulos, Aristotle University Thessaloniki

Mapping Urban Air Quality Using a Network of Low-Cost Sensors: A Data Assimilation Approach (oral)

Philipp Schneider, Nuria Castell, William Lahoz, Alena Bartonova

Norwegian Institute for Air Research, Kjeller, Norway

Sensor Data Management based upon the OGC Sensor Things API (oral)

Reinhard Herzog

Fraunhofer Institute of Optronics, System Technology and Image Exploitation IOSB, Karlsruhe, Germany

Computational Intelligence methods for low-cost AQ sensor performance improvement (oral)

Kostas Karatzas

Aristotle University of Thessaloniki, Informatics Systems & Applications -

Environmental Informatics Research Group (ISAG-EI), Thessaloniki, Greece

Distributed network of inexpensive air quality sensors for particulate matter monitoring in Poland (oral)

Michal Misiek

Airly, Krakau, Poland

17:30 End of first day / Meeting of the SmartAQnet Advisory Board

19:30 Joint dinner

„Zum Augustiner“

Neuhauser Str. 27 (Fußgängerzone)

80331 München

05/12/2018 Day 2: Air Quality Modelling and Applications

9:00 Session on **Small-scale numerical simulations**

Moderation: *Klaus Schäfer, Atmospheric Physics Consultant;*

Roland Schrödner, Leibniz Institute for Tropospheric Research (TROPOS)

Air Quality Modelling on Urban Scale over Munich (oral)

E. Khorsandi¹, F. Baier², T. Erbertseder², M. Bittner^{1,2}

¹ *Augsburg University, Institute for Physics, Augsburg, Germany*

² *German Aerospace Center (DLR), German Remote Sensing Data Center (DFD), Oberpfaffenhofen, Germany*

Multiscale Modelling Tools for Flow and Dispersion Calculations in Urban Areas (oral)

N. Moussiopoulos¹, G. Tsegas¹, F. Barmpas¹, A. Hellsten²

¹ *Laboratory of Heat Transfer and Environmental Engineering, Aristotle University, Thessaloniki, Greece*

² *Finnish Meteorological Institute, Helsinki, Finland*

High resolution urban air quality modelling - Leipzig case study (oral)

Michael Weger, Bernd Heinold, Thomas Müller, Liina Tönission, Roland Schrödner, Oswald Knoth

Leibniz Institute for Tropospheric Research (TROPOS), Leipzig, Germany

10:00 Coffee break

10:30 Session on **Personal exposure for use in epidemiological studies**

Moderation: *Josef Cyrus, Helmholtz Zentrum München;*

Philipp Schneider, Norwegian Institute for Air Research

Bioaerosols and human health in a changing world: Need for a global Electronic Spore and Pollen Information Network (E-SPIN) (oral)

Athanasios Damialis¹, Franziska Haering¹, Manuel Glaser², Jens O. Brunner², Gertrud Hammel¹, Stefanie Gilles¹, Claudia Traidl-Hoffmann^{1,3,4}

¹ *Chair and Institute of Environmental Medicine, UNIKA-T, Technical University of Munich and Helmholtz Zentrum München, Augsburg, Germany*

² *Chair of Health Care Operations/Health Information Management, UNIKA-T, Faculty of Business and Economics, University of Augsburg, Germany*

³ *Christine Kühne Center for Allergy Research and Education (CK Care), Davos, Switzerland*

⁴ *Outpatient Clinic for Environmental Medicine, Klinikum Augsburg, Augsburg, Germany*

Using low-cost air quality sensors for personal exposure assessment (oral)

Philipp Schneider, Nuria Castell, Alena Bartonova

Norwegian Institute for Air Research, Kjeller, Norway

Personal Exposure to Ultrafine Particles, Black Carbon and PM_{2.5} in Different Microenvironments (oral)

Josef Cyrus, J. Gu, M. Pitz, A. Peters

Helmholtz Zentrum München, Germany

A novel tool supplying aeroallergen information and allowing for online, personalized symptom monitoring (oral)

Stefanie Gilles¹, Anna Muzalyova², Manuel Glaser², Jens Brunner², Claudia Traidl-Hoffmann^{1,3}, Athanasios Damialis¹

¹ *Chair and Institute of Environmental Medicine, UNIKA-T, Technical University of Munich and Helmholtz Zentrum München, Augsburg, Germany*

² *Chair of Healthcare Operations and Health Information Management, UNIKA-T, Augsburg University, Augsburg, Germany*

³ *Christine-Kühne Center for Allergy Research and Education (CK Care), Davos, Switzerland*

- 11:45 Session on **Applications of smart air quality networks**
Moderation: *Andreas Phillip, University of Augsburg;*
Katharina Predehl, Institute for Physical Measurement Techniques, FhG
- Measurement of wind flow in complex topography (oral)
Katharina Predehl, Institute for Physical Measurement Techniques, FhG, Freiburg, Germany
- 'Lungs of the City': A City Center-Scale Intervention Study to Curb Urban Air Pollution (oral)
Guido Jenniskens
ENS Clean Air, Cuijk, The Netherlands
- Development of an air quality related predictive live platform based on near real-time data (Poster)
Johanna Redelstein, Erik Petersen, Andreas Philipp
University of Augsburg, Institute of Geography, Augsburg, Germany
- Applications of smart air quality networks – a particle matter exposure driven traffic routing (Poster)
Erik Petersen, Johanna Redelstein, Andreas Philipp
University Augsburg, Institute of Geography, Augsburg, Germany
- 12:30 Lunch
- 13:30 **Discussion summary for project mid-term meeting and future collaboration**
Klaus Schäfer
Atmospheric Physics Consultant
- 13:40 **Plenary discussion**
Moderation: *Till Riedel, Karlsruhe Institute of Technology;*
Nicolas Moussiopoulos, Aristotle University of Thessaloniki
- 14:30 **Wrap up and potential next steps towards future collaborations**
Moderation: *Till Riedel, Karlsruhe Institute of Technology;*
Nicolas Moussiopoulos, Aristotle University of Thessaloniki
- 15:00 End / Open slots for dedicated discussion rounds

We recommend a taxi from the airport to the HMGU (about 60 Euros), as it is a bit complicated and time consuming to get here by public transport. We will present coffee, tea, refreshments and cakes during the breaks and ask for financial contribution of 15 Euros – we will collect it cash in the beginning (please accurately). We will go for lunch in the HMGU restaurant (about 7 Euros each).