

Project-Consortium SmartAQnet – Aerosol Academy

18. Newsletter SmartAQnet

October- December 2019





Table of Contents

Work Package 0: Project Management 2

Work Package 1: Data Mining and Measurement Campaigns 2

Work Package 2: Data Collection/ Devices 3

Work Package 3: Data Aggregation and Analysis 5

Work Package 4: Data Application 5

Work Package 5: Data oriented dissemination and application 5

More Information 6

Editorial

Dear interested parties in fine dust measurements,

Measurement campaigns continue! The sensors in Augsburg are now regularly serviced and the data is further integrated into the data platform.

Mostly in October and November, we presented the results of our measurements at several conferences and created posters.

Don't forget: On the website <https://www.smartaq.net> you are always up to date.

I wish you a Merry Christmas and a Happy New Year!

Sincerely,

Katja Kornetzky



Work Package 0: Project Management

GRIMM:

An insight into the project planning for the new measuring instruments (Fig. 1). By now, the sensor nodes can calibrate themselves so that long-term measurements can be carried out reliably.

In the meantime 47 instruments have been installed.

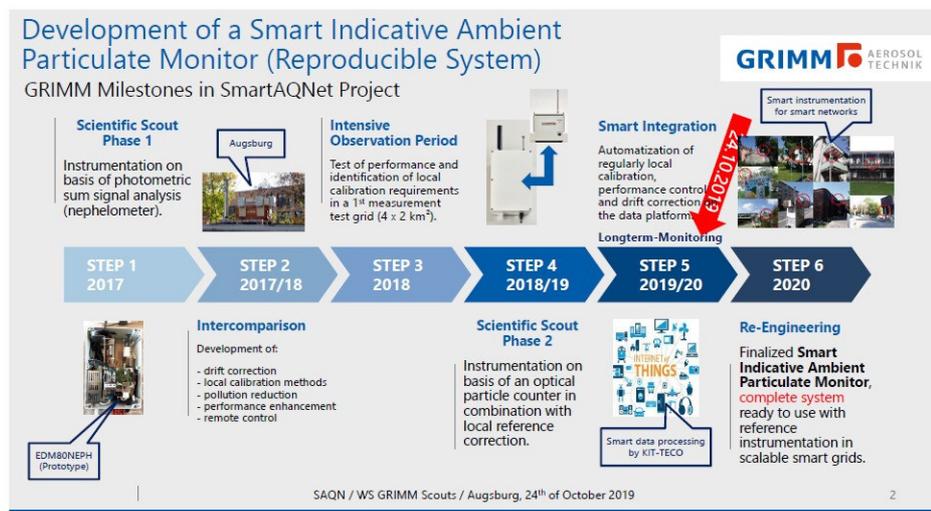


Fig.1: Development process of the Scientific Scouts at GRIMM

Work Package 1: Data Mining and Measurement Campaigns

KIT TECO:

In November TECO conducted a workshop on data upload.

HMGU EPI:

Ongoing maintenance process of all scientific scouts EDM80NEPH which are already installed in Augsburg, together with M. Hank (Grimm). The network is continuously updated to avoid connection problems, system failures etc.

The HMGU EPI team is now able to check if the Scouts are running properly without the need to visit the SAQN website.

Work Package 2: Data Collection/ Devices

10.24.2019: Workshop by GRIMM for partners working with Scientific Scouts and all interested parties about functionality, application possibilities and measurement characteristics. Attendants: GRIMM, City of Augsburg, HMGU-CMA, HMGU-EPI and IGUA.

Continuous data evaluation and validation of existing measured values in Augsburg.

Work on the algorithm and functionality of control and evaluation software for EDM164 and EDM80OPC V1.0 and version 3.0 light.

HMGU:

Start of mobile measurements for the autumn season 2019 HMGU(CMA) activities.

In November, the mobile measurements for the autumn season 2019 were finalized. A cross validation of the performance of different instruments (CPC3007 and Testo DiSCmini) in 3 micro-environments (Park, Center, Industry and Traffic) along the route for mobile measurements is shown in the following figure.

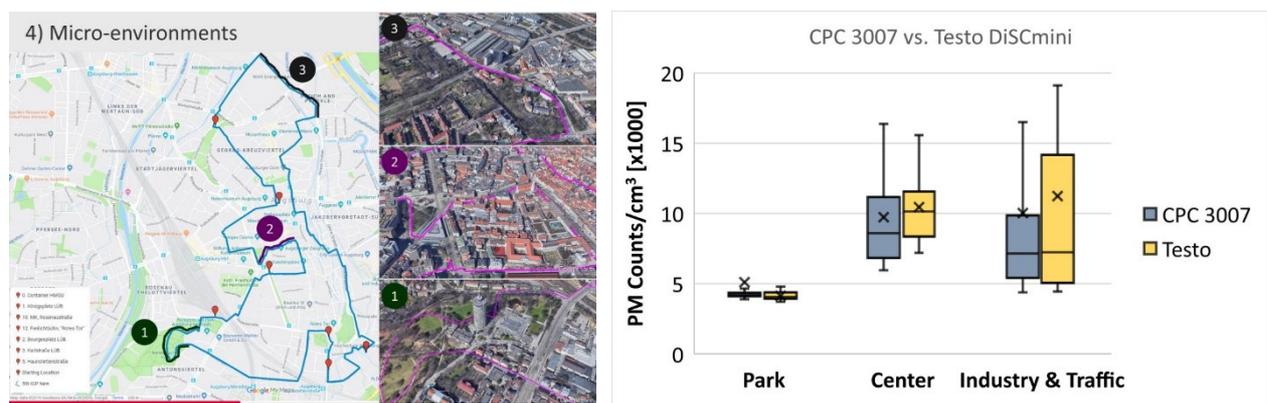


Fig. 5: Cross validation of CPC3007 und Testo DiSCmini

IGUA:

Participation in the annual meeting of the climate working group from 25.10. - 27.10.2019 in Jesteburg. The following presentations were held (in German):

Erik Petersen et al.: Mobile Messung der räumlichen Verteilung von Partikelmasse im Stadtgebiet Augsburgs.

Andreas Philipp et al.: Sondierung der urbanen Grenzschicht mit unbemannten Luftfahrtsystemen im Rahmen des Verbundprojekts „Stadtklima im Wandel / Urban Climate Under Change [UC²]“.

Poster (German):

Johanna Redelstein et al.: Sondierung der Grenzschicht mit Unbemannten Luftfahrtsystemen, Ceilometer und SODAR RASS mit Fokus auf die Feinstaubbelastung.

Participation in the Clean Air Experts Day on 29.10.2019 in the Augsburg Trade Fair Centre with exhibition of measuring instruments and exchange with participants from local authorities and industry on the subject of fine dust measurement.



Fig. 6: Booth of Universität Augsburg at Clean Air Experts Day

Nine OK-Lab sensors were distributed to other volunteers. A first version of the humidity correction of the OK-Lab sensors was performed, a bias correction and an online execution of the corrections are planned.

In **December**, measurement experiments were carried out to determine the wind speed using position data from the copter. For this purpose, several flights over a distance of 100 - 400 m at different speeds were carried out on a windless day to simulate different wind speeds. First calculations have already been performed. However, the algorithm still needs to be improved.

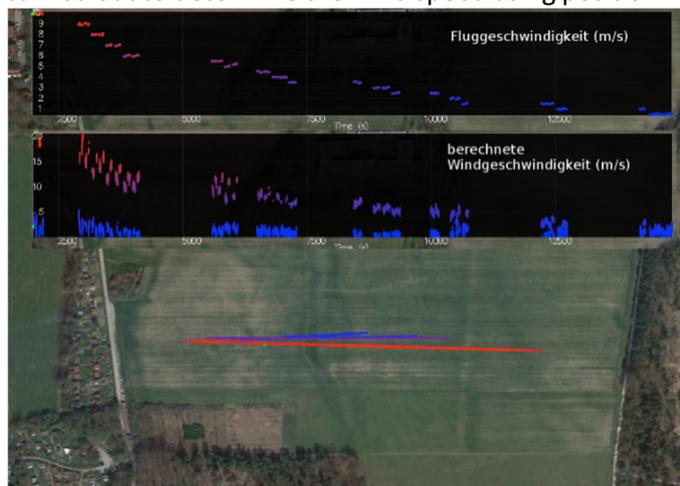


Fig. 7: Test flights on 05.12.2019 at the Luisenruh in Augsburg-Haunstetten.
Above: Timeline of flight speed, below calculated wind speed.

AA:

Market monitoring was continued by collecting all relevant publications on low and mid-cost sensors and Smart Air Quality Networks as well as information on companies relevant to air quality monitoring by middle and low cost sensors and placing it in the project archive.

Work Package 3: Data Aggregation and Analysis**HMGU EPI:**

We continued to collect reference data of the instruments in the HMGU containers and validate them. A transfer of project data is in preparation.

Work Package 4: Data Application**KIT TECO:**

Internal workshop on data upload conducted in November.

GRIMM:

Internal workshop on Scientific Scouts conducted in October.

Work Package 5: Data Oriented Dissemination and Application**GRIMM:**

Participation of Volker Ziegler in discussion on "Particles and Health", see Twitter entry.

**AA:**

A contract was signed with the **Evangelisches Forum Annahof in Augsburg** for conducting the final events of the project on **3 and 4 June 2020**. A first invitation to these events in the Augustanahaus in Augsburg was sent to more than 150 partners.

The development of the business plan will continue.

HMGU EPI:

Participation in data upload workshop of KIT-TECO.

KIT/ TECO:**Publications:**

Long Wang, Lennard Sommer, Till Riedel, Michael Beigl, Yexu Zhou, and Yiran Huang (2019) NeuralIO: Indoor Outdoor Detection via Multimodal Sensor Data Fusion on Smartphones. 4th EAI International Conference on IoT in Urban Space.

Yao Shen, Stephan Lehmler, Syed, Monjur Murshed and Till Riedel

(2019) Characterizing air quality in urban areas with mobile measurement and high resolution open spatial data: comparison of different machine learning approaches using a visual interface. 4th EAI International Conference on IoT in Urban Space.

IGUA:**Presentation and Publication:**

Redelstein, J., Budde, M., Cyrys, J., Emeis, S., Gratza, T., Grimm, H., Hank, Holst, C., M., Münkler, C., Pesch, M., Petersen, E., Philipp, A., Riedel, T., Riesterer, J., Schäfer, K., Schnelle-Kreis, J., Uhrner, U., Werhahn, J., Ziegler, V., Beigl, M.: Assessment of three-dimensional, fine -granular measurement of particulate matter by a smart air quality network in urban area. In: Remote Sensing of Clouds and the Atmosphere XXIV, edited by Adolfo Comerón, Evgueni I. Kassianov, Klaus Schäfer, Richard H. Picard, Konradin Weber, Upendra N. Singh, Proceedings of SPIE, SPIE, Bellingham, WA, USA, Vol. 11152, 111520N-1 – 111520N-8 (2019); doi: 10.1117/12.2533096.

More Information

Participation in conferences and working groups is noted in the respective chapters.