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Newsletter SmartAQnet

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Newsletter August 18
Smart Air Quality Network

Table of contents

Project management

First year face-to-face meeting

KIT TECO, the project coordinator of SmartAQnet, organised the 1st-year Face-to-Face-meeting in Augsburg. All project partners have been invited to join the meeting at the "WZU Augsburg" (Environmental Science Center at the University of Augsburg).

All of the project partners have done so and as a result, all participated the Meeting on 25th and 26th July 2018.). According to the welcoming, the focus in the first session was set on presentations about the status of the following task forces (in brackets: task force leader and speaker):

- TF Data Provisioning (Johannes Werhahn, IMK-IFU)
- TF SOPs & Meta Data (Marcus Hank, GRIMM),
- TF Network Planning (Marcel Köpke, KIT TECO and Erik Petersen, Univ. of Augsburg) and
- TF Communications (Johannes Riesterer, KIT TECO).

Subsequently to a short discussion, the second session focussed on the current status of ongoing work, Milestones, Publication plans, Calls and the specific work packages, which were:

- Management (Till Riedel, KIT TECO)
- Measurement Campaigns (Michal Kowalsky, HGMU EPI)
- Measuring Devices (Marcus Hank, GRIMM)
- Data aggregation and –analyses (Klaus Schäfer)
- Applications (Andreas Philipp, Univ. of Augsburg)
- Data based exploitation (Stefan Hinterreiter, Aerosol Akademie)

All sessions were well prepared and the presentations (see in Figure 1: Michal Kowalski giving his oral presentation) demonstrated all partners, what have been done in the past months and – furthermore – what has to be done especially within the upcoming months (IOP is beginning mid-September).

Figure 1: Michal Kowalski presenting the results of work package measurement campaigns.

The second session was closed by a discussion round and subsequently to a short break, all participants took part in a sightseeing tour to the potential measurement sites in Augsburg. Some impressions of the tour can be found in Figure 2 to Figure 4.

Figure 2: Measuring site Königsplatz

Figure 3: Measuring sites Karlstraße (left) and Klostergarten (right)

Figure 4: Measuring site Bourgesplatz

The second day started with intensive discussions (like shown in Figure 5) dealing with the planned external Workshop in December, a possible Video shooting within the IOP, approaching IOP planning needs, publication plans and so on. More details will follow within the minutes of the meeting.

Figure 5: Intensive discussions at the meeting in Augsburg

Data mining and campaigns

The start of the first intensive measuring campaign is casting its shadow: therefore project partner Helmholtz Zentrum München (HGMU) took intensively care about the preparation of the measuring sites. Some parts of this work contain the description of the measurement stations selected for the measurement campaign phase 1 (location, photos, detection of on-site available W-LAN networks) and – together with project partner GRIMM – the preparation of the devices (EDM80NEPHs and EDM164s)

for the installation (mounting racks, WiFi modems and so on). As a result, Thomas Kusch, Michal Kowalski, Marcus Hank (GRIMM) and J. Seitz (LfU Bayern) have installed five EDM80NEPHs (so-called scientific scout) and one EDM164 (reference instrument) at the four state air quality monitoring stations and the Aerosol station of the German Research Center for Environmental Health (HMGU) on the University of Applied Sciences of Augsburg. The devices at the measuring sites are shown in the following figures: LfU headquarter (see Figure 6), Königsplatz (Figure 7), Karlstraße (Figure 8) and Bourgesplatz (Figure 9). Two devices (1 x EDM80NEPH and 1 x EDM164 as reference) were settled at the site Klostergarten (Figure 10). A second set consisting of 1 x EDM80NEPH and 1 x EDM164 will be installed at Schertlinstraße as soon as the written permission is available.

Figure 6: EDM80NEPH at the measurement site LfU headquarter

Figure 7: EDM80NEPH at the measurement site Königsplatz

Figure 8: EDM80NEPH at the measurement site Karlstraße

Figure 9: EDM80NEPH at the measurement site at Bourges Platz

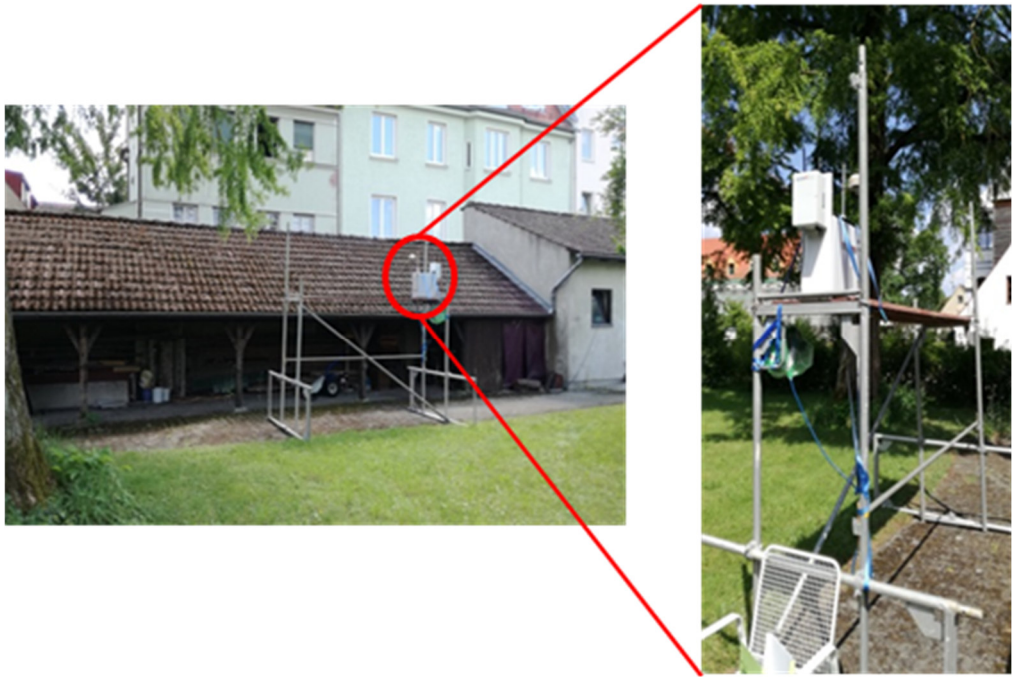

Figure 10: EDM80NEPH at the measurement site Klostergarten

According to the installation, Michal Kowalski and Thomas Kusch (both HGMU) checked the connectivity of the devices to mobile hotspots at every monitoring site. All devices are working well, the connection to the created mobile hotspot is stable and the status of the connection can be checked via Team Viewer. Furthermore, HGMU and GRIMM (Marcus Hank) are planning to set up a secure WiFi connection, in order to allow a download of the logged data.

Additionally to the sites in the city of Augsburg, a regional-background site will be set up by HGMU at Hof Lindenau. It is planned, that a small HMGU measurement container, which is currently located at the site Königsplatz, will be moved to Hof Lindenau. HMGU already visited this site, selected the specific location and contacted the owner in order to get permission to install the small container there. Currently the preparation for the transport of the measurement container is ongoing.

The SmartAQnet project contains different measurements at fix stations, mobile measurements and remote sensing. As written in the last newsletters, mobile measurements with bicycles have already started and within the last weeks some amendments have to be performed. KIT TECO and the University of Augsburg integrated SDS011 particulate matter sensors into the bicycle bags. For this integration, the python scripts provided by KIT-TECO were integrated into the Raspberry Pi, which controls the Alphasense OPC-N2. Furthermore, the comparative measurements at the Aerosol station on the University of Applied Sciences of Augsburg container have been terminated. Therefore, the two LOACs and one Alphasense OPC-N2 have been dismounted from there. While the Alphasense OPC-N2 is being used as a mobile device, the location searching for the two LOACs is still in progress.

Finally, the measurement site for an additional ceilometer CL31 was determined: it will be installed inside of the Monastery garden, near to the constructed EDM80NEPH/EDM164 station in order to get a north-south profile of mixing layer height observations together with a ceilometer CL 51 at the Institute of Geography of the University of Augsburg in the South and a ceilometer CL 31 at the Aerosol station of HMGU on the University of Applied Sciences of Augsburg.

Data collection and devices

Project partner GRIMM is working hard on improvements for the scientific scouts 1 und 2. As already known, the scientific scouts 2 shall be implemented in the second intensive measuring campaigns next year.

Data aggregation and analyses

As a part of SmartAQnet, remote sensing and numerical simulations shall be implemented within the working period. Based on historical data by Ulrich Uhrner, TU Graz, and Johannes Werhahn, KIT/IMK-IFU, numerical simulations of the wind field by GRAMM and the PM10 concentrations by GRAL were successfully performed. More details will follow within the next newsletters.

Data application

Now, there are no news available. However, we will keep you informed.

Data oriented dissemination and application

Within the last weeks, the SmartAQnet consortium has visited several workshops and meetings:

- Till Riedel and Klaus Schäfer took part at the KIT - Aristotles University Thessaloniki cooperation workshop in Thessaloniki, which was from 09 until 10 July 2018. At the workshop, they gave an oral presentation about the SmartAQnet project and developed topics of scientific cooperation.
- Moreover, a further oral presentation about SmartAQnet was hold by Stefan Emeis at the VDI Workshop “Sensormesstechnik für die Außenluft – Status, Grenzen und Visionen” at Wiesbaden (13 June 2018).

Beside these activities, Klaus Schäfer had a meeting with the school initiative “Jugend forscht”. Within the consortium it is now discussed, how SmartAQnet can contribute to “Jugend forscht” and cooperate with laypersons.

Stefan Hinterreiter (Aerosol Akademie) and Klaus Schäfer already taking care about the prearrangement of the external workshop, which is planned for winter 2018. The workshop is dedicated to partners taking care of SmartAQnet-related topics like e.g. operating a wide-spread distributed PM-measuring network, investigation of high-resoluted spatial-temporal distribution of PM, Internet of Things Stack using the latest Smart Data technologies and so on. More information will follow within the next newsletters.

Further information

KIT-IMK/IFU

On return from Reading, Duick Young finally resigned from his contract. The resignation becoming effective on 01 August 2018. Johannes Werhahn, member of the working group of Prof. Dr. Stefan Emeis is going to continue the designated work.

University of Augsburg

The University of Augsburg successfully performance of a three-day measurement campaign in Berlin (16/07 – 19/07/2018) with UAV ascents at three locations. With these measuring flights, further experiences have been gained and can now be used for the SmartAQnet-IOP in September / October in Augsburg.