Near real time assessment with low-cost sensors (FAIRMODE CT6)

Analysis of sensor data

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FAIRMODE
Forum for air quality modelling in Europe

Meeting

There were several interesting presentations and a lively discussion with participants from Italy, Portugal, France, Ireland, the UK, Belgium, Slovakia and the Netherlands.

Alicia Gressent applied a different scheme in selecting “valid” sensor data to the Dutch sensor data and also made the calibration of groups of sensors dependent on the distance between sensors and official data and also dependent on the classification of the official stations. These choices lead to different results from the Dutch approach. She presented the “SEnSors for Air quality Mapping (SESAM)” system and applied it to the Dutch data. Different approaches to the calibration and Air Quality mapping are in progress.

Pascal Joassin and Fabian Lenartz presented an approach based on individual sensors. They start from sensors that are within 20 km from at least 3 official stations and analyse the relations between these sensors and official measurements. A regression of the available data for these selected sensors is performed and used to estimate a calibration for the other sensors.

Joost Wesseling presented the results of tests using all the available PM2.5 and PM10 sensor data in the Netherlands and Belgium in 2020. Apart from a small region in the south of the Netherlands, the yearly average results of the calibrated sensors are in just over 90% of the cases within 50% of the average official measurement. However, no individual sensor in the neighbourhood of an official measurement location produced data for more than 5500 hours.

Work in the coming months

An inventory was made of the plans of the participants for working on the benchmark over the next few months:

INERIS: Alicia Gressent will keep working on her analysis and data fusion of the available Dutch sensor data.
ISSeP: Pascal Joassin and Fabian Lenartz will further develop the sensor-bases approach.
UA: Vera Rodrigues is working on a Matlab tool for analysing the sensor data, which she expects to demonstrate at the next CT6 meeting.
UCC: Stig Hellebust expects to be able to present some work at the next meeting.
VITO: Stijn Janssen also expects to be able to present some work at the next meeting.
RIVM: Joost Wesseling is working on Bayesian combination of sensors and other data. Hopefully there will be (a) student(s) available for an analysis of the calibration of individual sensors.

Next meeting

The next FAIRMODE/CT6 meeting will be **June 3rd, 2021, from 10:00 to 12:30**.

After this meeting, the following is expected in September, 2021. During this meeting we can discuss the input for the FAIRMODE technical meeting scheduled for October, 2021.

We can invite some people from the AQUILA community or from CEN/WG42 for the September meeting.

Tentative Schedule 2021-2022

An updated version of the actions for the upcoming two years is as follows.

2021 Jan-Oct:	Work on benchmarks, regular meetings of CT6. - Test/improve present techniques. - Develop/test new approaches. - Apply to other data sets. - …
2021 Feb:	All parties involved “play” with the data.
2021 Mar:	Report proces at FAIRMODE plenary meeting. If possible, initial results will be presented.
2021 Mar:	Next technical CT6 meeting on the web. RIVM will plan a next meeting in the second half of March.
2021 April:	Show & Tell meeting.
2021 June:	Show & Tell meeting.
2021 Sep:	Show & Tell meeting, discuss input Technical Meeting FAIRMODE. Invite people from AQUILA?
2021 Oct:	Technical results/feedback in a CT6 session of the FAIRMODE technical meeting.
2022 Summer:	Write article?