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Comparison of low and mid cost aerosol samplers with high quality sensors in the urban area of Augsburg

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Due to the complexity and efforts of high quality aerosol measurements, they are usually very sparsely distributed in space. Therefore, conclusions concerning particle matter distribution and concentration can be inaccurate especially in urban areas. Over the course of the development of micro processing units, several mid and low cost sensors, i.e. the Alphasense OPC-N2, came into market. This makes mobile measurements feasible and can complement the spatially selective high quality measurements.

Such mobile measurements with low and mid cost sensors will be conducted within the government funded project Smart Air Quality Network (SmartAQnet). Therefore, those sensors will be carried via bicycle on a network of traffic routes within the city of Augsburg, Germany. Additionally, the lightweight sensors shall be installed upon unmanned aerial vehicles to measure the vertical distribution of particle matter. Among others, the goal of these two mobile measurement techniques is to validate data from supplementary ultra-low cost sensors.

To ensure validity, the low and mid cost sensors were compared with common high quality units at the stationary measurement site. This was undertaken during the late fall and winter period of 2017 and early 2018 at a background measurement site within the city of Augsburg. Throughout the complete period, Alphasense OPC-N2 and Light Optical Particle Counters (LOAC) from Meteomodem were compared. Several high quality measurement units, i.e. from TROPOS, TSI Inc. and Grimm Aerosol, are located at the measurement site operated by the Helmholtz Association. In this poster first findings of the comparison between the stated sensors are being presented.