

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

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Reliable pollution measurements are time-consuming and expensive. This typically results in either very few measurement points or in lengthy measurement duration (analog measurements such as passive NO₂ collectors) resulting in only averages for a larger number of points. There has been a lot of work around low-costs sensor technologies in the last few years, especially for the pollutants particulate matter (PM, sub-divided into the particle sizes <10 µg, <2.5 µg and <0.1 µg) and Nitrogen Dioxide (NO₂). Many of the results have been disappointing but there have been some grounds for optimism as well as a clear need to use the sensors in the correct way.

In this work, we present a deployment of 15 measurement "nodes" in Bern, Switzerland with a collection of carefully arranged sensors for PM₁₀, PM_{2.5}, NO₂ and O₃ measurement. Thanks to a collaboration with local authorities, a calibration procedure could be developed based on local conditions and pollution values to aid measurement around the city. The project will be presented and the results evaluated with respect to the German regulations for indicative/complementary measurements (39th BImSchV).