

# Temporal and Geographical Contrasts in Pollutant Exposures – Implications for Epidemiological Research

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Epidemiological studies have made important contributions to our understanding of the associations between the air pollution and adverse health effects. While ambient monitoring network data provides highly resolved information on temporal variation in air pollution, it is not able to provide information regarding the spatial variability in concentrations within urban areas. Until recently, studies of long-term exposures have mainly focused on spatial comparisons between cities with different ambient pollutant concentrations. This approach masks any contribution of within-city differences in concentrations. Land use regression (LUR) modeling has been already applied to a number of long-term studies as a method of estimating individual level of exposure (based on residential addresses). Recently exposure assessment approaches for epidemiologic studies of air pollution and adverse health effects have evolved from reliance on available ambient monitoring network data toward approaches to characterize high-resolution temporal-spatial concentration differences. The SmartAQnet project [1] will deliver data for such an approach. Some novel methods to characterize spatial and temporal variation in air pollutants in an urban community will be discussed in the presentation.

## References

- [1] Matthias Budde, Till Riedel, Michael Beigl, Klaus Schäfer, Stefan Emeis, Josef Cyrys, Jürgen Schnelle-Kreis, Andreas Philipp, Volker Ziegler, Hans Grimm, Thomas Gratza (2017) SmartAQnet: Remote and In-Situ Sensing of Urban Air Quality, Proc. SPIE 10424, Remote Sensing of Clouds and the Atmosphere XXII, 104240C, doi:10.1117/12.2282698