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## A23G-2461: CH<sub>4</sub> emissions from European Major Population Centers: Results from aircraft-borne CH<sub>4</sub> in-situ observations during EMeRGe-Europe campaign 2017

Tuesday, 12 December 2017

13:40 - 18:00

 New Orleans Ernest N. Morial Convention Center - Poster Hall D-F

Urban environments represent large and diffuse area sources of CH<sub>4</sub> including emissions from pipeline leaks, industrial/sewage treatment plants, and landfills. However, there is little knowledge about the exact magnitude of these emissions and their contribution to total anthropogenic CH<sub>4</sub>. Especially in the context of an urbanizing world, a better understanding of the methane footprint of urban areas is crucial, both with respect to mitigation and projection of climate impacts. Aircraft-borne in-situ measurements are particularly useful to both quantify emissions from such area sources, as well as to study their impact on the regional distribution. However, airborne CH<sub>4</sub> observations downstream of European cities are especially sparse.

Here we report from aircraft-borne CH<sub>4</sub> in-situ measurements as conducted during the HALO aircraft campaign EMeRGe (Effect of Megacities on the Transport and Transformation of Pollutants on the Regional to Global Scales) in July 2017, which was led by the University of Bremen, Germany. During seven research flights, emissions from a variety of European (Mega)-cities were probed at different altitudes from ~3km down to ~500m, including measurements in the outflows of London, Rome, Po Valley, Ruhr and Benelux. We will present and compare the CH<sub>4</sub> distribution measured downstream of the various studied urban hot-spots. With the help of other trace gas measurements (including e.g. CO<sub>2</sub>, CO, O<sub>3</sub>, SO<sub>2</sub>), observed methane enhancements will be attributed to the different potential source types. Finally, by the combination of in-situ measurements and regional model simulations using the EMAC-MECO(n) model, the contribution of emissions from urban centers to the regional methane budget over Europe will be discussed.

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