Geophysical Research Abstracts
Vol. 21, EGU2019-1301-1, 2019
EGU General Assembly 2019

Peroxy radical airborne observations during EMeRGe over Rome and Manila

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Observations of tropospheric peroxy radicals are a key point for interpretation of the processing and transformation of polluted outflows from major populated centers (MPCs). A series of European and Asian MPCs are investigated by the project EMeRGe (Effect of Megacities on the transport and transformation of pollutants on the Regional and Global scales). With this objective two airborne campaigns using the research platform HALO (High Altitude and LOng Range aircraft) were carried out over Europe in summer 2017 and in East Asia in spring 2018.

The Institute of Environmental Physics (IUP) in Bremen participated in both EMeRGe campaigns with the airborne measurement of the total sum of peroxy radicals, RO_2^* =($HO_2 + \sum RO_2$), by using the home made PeRCEAS instrument based on the combination of the PERCA (peroxy radical chemical amplification) and CRDS (cavity ring down spectroscopy) techniques. One of the main purposes of the campaigns was the investigation of MPC outflow at the local and regional scales. Within the EMeRGe targeting MPCs in Europe and Asia, Rome and Manila are selected in this presentation for having similar meteorology and photochemical conditions during the EMeRGe campaigns. Significant RO_2^* were observed ca. 55 pptv around Rome and ca. 75 pptv around Manila.

Peroxy radical mixing ratios observed upwind and downwind Rome and Manila are compared and interpreted according to the different composition of the air masses sampled.