



## **Observation of vertical and horizontal urban structures in Paris for ozone and aerosols**

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Air pollution and its impacts are subject to an expanded interest since the middle of the 20th century, especially in urban areas which gathered an important part of emission sources. The polluted urban air masses are composed by a complex mixture of gases and particles coming from various emission sources (vehicular traffic, industries, residential heating, agricultural activities, natural sources) or chemical processes. Among these pollutants, ozone plays a crucial role in atmospheric pollution because of its impact on health and vegetation. Particles are also implicated in many environmental issues, such as acidic rainfall, eutrophication, radiation budget modification, cloud properties modification, and health issues.

Trying to get some insight in vertical urban gradient, continuous measurement of ozone and particle number concentrations have been set up for an entire year on a touristic tethered balloon in Paris. This latter, perform regular touristic flights from ground up to 150m all over the year. Some scientific flights go even up to 300m. The measurements performed on this platform are complementary with those of the air quality survey network (Airparif) since they add information on vertical gradient of concentrations. In addition horizontal Lidar aerosol scans have been performed at different altitudes from the balloon trying to establish aerosol concentration map over Paris to highlight concentrated hotspot related to high emissions and horizontal disparities for aerosol concentrations.

In this presentation, a study of ozone and aerosol concentration vertical profiles over a full year will be presented as well as the Lidar campaign. We will first present the context and the instrumentation installed at the platform "Ballon Generali". We will then discuss the vertical profiles for ozone and aerosol concentrations. A focus will be made on an ozone episode which occurred during summer 2018 in Paris during several days with ozone concentrations exceeding the information threshold. The Lidar campaign which took place during summer 2018 will then be presented and first results will be discussed. Finally, conclusions will be drawn and perspectives will be given concerning the measurements at this platform.