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Characteristics of reactive nitrogen compounds (NOy, PAN, HONO, NOx) and other relevant trace gases (O3, CO) in Paris plume during MEGAPOLI summer campaign

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Within the FP7 MEGAPOLI project, an intensive field campaign has been conducted in the Greater Paris region during July 2009. The main objective of this campaign was to quantify sources of primary and secondary aerosol and gas-phase, in and around a large agglomeration and to document their evolution in the megacity plume.

To study characteristics of reactive nitrogen species NOy in and around Paris, ambient mixing ratios of NO, NO2, NOy, PAN, NMHCs (C3-C10), HCHO, HONO, O3, photolysis frequency of NO2 (JNO2), and usual meteorological parameters were measured at the SIRTA site, located south west of Paris. In addition, NO, NO2, NOy, HCHO and NMHCs measurements were performed on board ATR-42, French research aircraft operated by SAFIRE. Flights were designed to study urban plumes : perpendicular flight legs to the wind direction were performed and gave pollutants gradient in and around the city plume.

In this contribution, spatiotemporal distribution of studied compounds (diurnal variation and sources) is discussed with respect to the air masses origin and to the photochemistry using photochemical clock like NO/NOy, NO/PAN. Indicators species such as O3/NOy, O3/NOz are used to determine NOx-VOC-O3 sensitivity regime under specific meteorological situations.