Université de Lille

FACULTÉ DES SCIENCES ET TECHNOLOGIES

Master Physique
du fondamental au professionnel
http://master-physique.univ-lille1.fr

International Master 2 Atmospheric Environment: Research Training 2018-2019

Laboratoire :LOA

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CaPPA Work Package: WP-1 From gas phase to aerosols (for example)

Individual exposition to atmospheric particulate pollution

Atmospheric particles are one of the main air pollutants, which may contain toxic products, some of which are considered carcinogens. According to the World Health Organization (WHO), the finest particles (<2.5µm) would reduce, on average, the life expectancy of French people by over 9 months. Levels of pollution measured within large cities regularly exceed regulatory standards. Measurements carried out by the ATMO network at the national level have shown that Lille is the third most polluted city in France with an annual average concentration of PM_{10} and $PM_{2.5}$ around 22 and 17 µg/m^3 respectively, larger than the limits set by WHO of 20 and 10 µg/m^3.

However, the facilities for measuring atmospheric pollution levels in the Lille region (142 km^2) are very limited, relying only on fixed measurement stations. ATMO HdF only has 2 measuring sites equipped with instruments for particle measurements (Leeds Boulevard, Fives). These two sites are apart from each other by 2 km, near high traffic roads. It is therefore difficult to extrapolate these measurements to provide information to the public about the pollution levels that they are exposed to during a day. For comparison, the measurement of particulate air pollution in Paris intramural (surface equivalent to that of the Lille Metropolitan Area - MEL) is carried out on 9 sites.

A consortium of several laboratories of the University of Lille set up a network of mobile, low cost, measurement stations, that usefully complement the conventional measurement techniques. These miniature sensors can be carried by volunteers (pedestrians or cyclists) in order to obtain high temporal and spatial resolution maps of air quality.

The objectives of this internship are:

(1) Study the variability of pollutants on the university campus and the Lille urban area

(2) Study of the exposure of Lille1 staff and students to pollutants in buildings and outdoors on campus.

Key words: aerosol, pollution, individual exposition