International Master 2 Atmospheric Sciences: Research Training 2022-2023

Laboratory: LASIRE

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Eventually CaPPA Work Package: WP3

Risk assessment of thunderstorm asthma in the Hauts-de-France region

Thunderstorm asthma designates the increase in acute respiratory illness in the hours before or after a thunderstorm and is often attributed to intense exposure to aeroallergens. To our knowledge, no such large-scale event have ever occurred in France. Only one article reports an episode of thunderstorm asthma in 2013 in Nantes with a 4-fold increase in the number of calls to emergency departments during the thunderstorm period compared to the previous days [1]. However, several large-scale episodes have been described in several countries since the 1980s [2]. An episode of unprecedented violence occurred in 2016 in Melbourne: several thousand people were admitted to the emergency room, with about thirty patients in intensive care and a heavy burden of about ten deaths [3]. In the context of climate change, the frequency of extreme weather events is predicted to increase and storm asthma episodes may become more frequent [4]. The lack of detection of these storm asthma episodes before the 1980s may also suggest a direct link with climate change or the continued rise in atmospheric atmospheric CO_2 concentration. Plants grown under a CO_2-enriched atmosphere produce more pollen grains and more allergens per pollen grain [5].

The objective of the internship is to compare emergency department admission data for asthma or respiratory diseases with airborne pollen concentrations, thunderstorm frequency, weather conditions, and air pollution. Emergency department admission data will be provided by SPF, pollen concentrations will be obtained from the French Aerobiology Network (RNSA), air pollution data will be obtained from Atmo Hauts-de-France, weather data and thunderstorm activity (lightning detection) will be obtained via measurements of electrical discharges made continuously on the multi-laboratory platform ATOLL (ATmospheric Observations in liLLe).

References:

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