International Master 2 Atmospheric Sciences: Research Training 2021-2022

Laboratory: LOA

Supervisor: Crumeyrolle Suzanne, Penide Guillaume

Tél : 03.20.43.44.72, E-mail : suzanne.crumeyrolle@univ-lille.fr , Guillaume.penide@univ-lille.fr

CaPPA Work Package: WP4: "Observations"

Scavenging of submicron aerosol particles in a suburban atmosphere

Today air pollution is one of the main threats to human health and climate change due to anthropogenic emissions and aerosols formed via gas-to-particle conversion in the atmosphere. As a result, in 2019 air pollution was considered by the WHO the main environmental risk to human health. Wet deposition or Below cloud scavenging, the main mechanism to remove atmospheric pollutants (Textor et al., 2006), has been studied from various standpoints, including air quality modelling, estimation of chemical compounds deposition or estimation of aerosol particles scavenging. The aerosol removal process by raindrops has been widely discussed and the study of this relationship comprises several processes, but the three most important ones involved are: i) Brownian diffusion (for particles with diameter (d_p) < 10 nm), ii) interception (for particles with d_p between 10 and 1000 nm) and iii) inertial impaction (for particles with d_p > 1000 nm).

The innovative approach of this study lies in the evaluation of the effect caused by different raindrop diameters on different particle sizes, a type of information scarcely found in the scientific literature. The main aim of this study is the evaluation of *BCS* through the scavenging efficiency and the scavenging coefficient for nucleation (d_p < 30 nm), Aitken (30 nm < d_p < 100 nm) and accumulation (100 nm < d_p < 1000 nm) mode particles, caused by different rainfall intensities in an urban background station.

Key words: aerosol; rain; scavenging efficiency