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 2021-2022

Laboratory: LOA

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CaPPA Work Package: WP5- Contributions to the study of interactions Aerosols/Clouds/Climate

Interpretation of photometric measurements of lightning by ASIM with the 3DMCPOL code

Lightning emits optical and radio flashes. They have been observed from space by various instruments for about twenty years. The photometric signals of flashes show characteristics (duration, amplitude, variation with the wavelength) induced by the scattering of the light by the storm cloud. A thesis carried out at the Laboratoire d'Optique Atmosphérique (LOA), in partnership with CEA DAM and CNES, which will be completed in early 2022, focuses on the sensitivity of the signal received from space, taking into account the characteristics of the lightning and the properties of the different particles constituting the cloud (hydrometeors and aerosols).

The objective of the internship will be to select photometric measurements made by the ASIM instrument on board the international space station when it flew over France. We will be interested in French thunderstorms because we have at our disposal precise radar measurements giving the characteristics of these clouds. We will also use the measurements of Météorage to locate precisely the electric discharge in the cloud. The developments made in the above-mentioned thesis will be used to interpret the ASIM measurements.

Required skills for the applicant:

Signal processing, image processing, radiative transfer, atmospheric physics.

Key words: Remote sensing, radiative transfer, measurement analysis, aerosols-clouds and storms