



Stage de recherche au LACy

Laboratoire de l'Atmosphère et des Cyclones

UMR8105 - Université de La Réunion, 97490 Saint-Denis de La Réunion

Titre du stage :

Assessment of ATLID L1B- and L2A-based stratospheric aerosol products

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Description du stage :

Contexte : Aerosols play a central role in the climate system by interacting with radiation, clouds, water vapor, and atmospheric chemistry. While recent advances in climate science have improved the quantification of their influence, these particles remain one of the main sources of uncertainty in climate projections. Unlike well-mixed greenhouse gases, their distribution is heterogeneous, their lifetime is limited, and their properties vary greatly depending on their origin, composition, and transformation processes. In the stratosphere, disturbances related to volcanic injections, mega-fires, space debris reentry, and rocket emissions are intensifying. These phenomena, coupled with the evolving space activity, pose new challenges for understanding atmospheric chemistry and radiative forcing. The anticipated reduction in certain dedicated satellite measurements and the current limitations of in situ sampling strengthen the need for more and better characterized stratospheric observations. ATLID timely deployment in space is providing a new insight of the stratosphere globally in terms of aerosols.

Objectifs : In this internship we plan to work on the development of codes providing both L1B and L2A aerosol products and a multitude of variables (extinction, backscatter, LR, etc.) in different geometries. These products will be developed in a way to fulfil adaptive, automatic and NRT capabilities of the codes in order to convert them (after the internship has ended) into centralized tools in ICARE available to the whole community and exploitable by automatic NRT browser.

Méthodologie/Outils et Attendus: Updating of the latest baseline available in the ESA data portal onto ICARE servers; Production of daily/zonal mean vs. space (latitude, altitude) vs. time of aerosol optical properties (scattering ratio, backscatter, extinction, lidar ratio, linear particle depolarization ratio, SAOD -stratospheric aerosol optical depth); Definition of selection criteria (on the quality status, zero-values, etc.) to filter only quality data; Improvement of the machine-user interactions for making the user experience more dynamic; Focus on the scattering ratio and SAOD that can be both retrieved from L1B and L2A. Assessment of their differences; Focus on the stratospheric aerosol type statistics of the TC product. Assessment of its accuracy and proposition for improvement.