



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

UAB
Universitat Autònoma
de Barcelona

UNIVERSITAT DE
BARCELONA

ICFO
The Institute
of Photonic
Sciences



Education and Culture DG

ERASMUS MUNDUS



MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS”

MASTER THESIS PROPOSAL

Dates: April - September 2019

Laboratory : Remote Sensing Lab., CommSensLab

Institution: Dept. of Signal Theory and Communications, Univ. Politècnica de Catalunya

City, Country : Barcelona, Spain

Title of the master thesis: Validation of solar radiative fluxes with satellite measurements

Name of the master thesis supervisor: Michaël Sicard

Email address : msicard@tsc.upc.edu

Phone number : 934011065

Mail address : UPC, Dept. TSC

c/ Jordi Girona, 1-3, Edif. D4-007

08034, Barcelona, Spain

Keywords : AERONET, radiative fluxes, top of the atmosphere, CERES, validation

Summary of the subject (maximum 1 page) : AERONET (Aerosol Robotic Network) is a well-known monitoring network of the atmospheric aerosols at the global scale. The inversion of the sky and sun radiance measurements gives a long list of aerosol and atmospheric properties, among them the shortwave radiative fluxes at the BOA (bottom of the atmosphere = surface) and at the TOA (top of the atmosphere). While the BOA fluxes have been validated with direct measurements of networked pyranometers, the TOA fluxes have never been validated. The project consists in elaborating two databases of fluxes at the TOA of key aerosol types (mineral dust, biomass burning, urban-industrial, continental background and oceanic): one of AERONET-estimated fluxes and another one of coincident direct satellite-based fluxes measured by CERES (Clouds and the Earth's Radiant Energy System). The comparison of both AERONET estimations and CERES measurements will then be performed in order to validate AERONET estimations for each one of the aerosol types considered.

Additional information :

* Desirable skills: background in atmospheric sciences and notions of Matlab would be appreciated.

* Miscellaneous : The UPC closes in August, but the student will have full access to his/her office and should be able to work on his/her own during that month.