



## MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS-POESII”

### MASTER THESIS PROPOSAL

**Dates: April - September 2018**

**Laboratory :** Remote Sensing Lab.

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

**City, Country :** Barcelona, Spain

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

**Name of the master thesis supervisor:** Michaël Sicard / Maria Jose Granados

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**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 :**

\* Required 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.