EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April 1st, 2016 – September 30th, 2016

Laboratory : Remote Sensing Lab. (RSLab), Universitat Politècnica de Catalunya
City, Country : Barcelona, Spain

Title of the master thesis : ALGORITHM DEVELOPMENT TO USE THE NEW DEPOLARIZATION CHANNEL OF THE UPC EARLINET LIDAR

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Summary of the subject (maximum 1 page) : The RSLab operates a 7-wavelength lidar (laser radar) within EARLINET (the European Aerosol Research Lidar Network). The lidar technique provides vertical range-resolved information on the optical and microphysical properties of the particles suspended in the atmosphere. The shape of the particles has a strong influence on the depolarization produced when they backscatter light from a linearly-polarized laser transmitter (spherical particles will not depolarize light while non-spherical particles will), which gives information on the particle nature and origin. The project will consist in developing an algorithm which will retrieve the particle depolarization ratio (which quantifies how depolarizing are the particles) by combining the signal of two channels. The mathematical theory on the subject is already existing and known. The algorithm will be tested with, for example, particles of Saharan dust which are highly depolarizing particles and often detected in Barcelona.
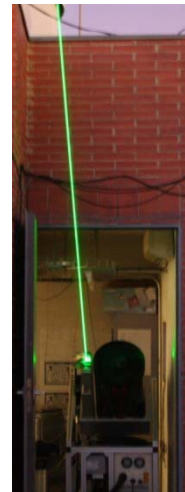
Keywords : lidar, atmospheric aerosols, depolarization channel, algorithm development

Additional information :
* Monthly allowance possible according to the student's progress and the group funding.
* Required skills: knowledge of LabVIEW would be highly appreciated, knowledge of optical CAD software packages (Zemax, for example) would help, but is not mandatory.