Demonstration of the EARLINET Capacity to Provide Near Real Time Data

Zoran Mijić

Institute of Physics Belgrade, University of Belgrade, Pregrevica 118, 11080 Belgrade, Serbia

The European Aerosol Research Lidar Network, EARLINET, was established in 2000 with the goal of creating a quantitative, comprehensive, and statistically significant database for the horizontal, vertical, and temporal distribution of aerosols on a continental scale [1]. EARLINET is part of ACTRIS (Aerosols, Clouds and Trace gases Research Infrastructure) a pan-European initiative consolidating actions amongst European partners producing high-quality observations of atmospheric aerosols, clouds and trace gases. Aerosol lidars with their high temporal and vertical resolution, provide reliable information on the atmospheric structure, its dynamics, and its optical properties. The Belgrade lidar station [2] participated in the several campaigns providing vertical aerosol profiles measurements which were submitted and processed by the Single Calculus Chain (SCC) in the near-real time (NRT). The SCC is a tool for the automatic analysis of aerosol lidar measurements developed within EARLINET network [3,4]. The main aim of SCC is to provide a data processing chain that allows all EARLINET stations to retrieve, in a fully automatic way, the aerosol backscatter and extinction profiles together with other aerosol products. Beyond the scientific goals of this campaign, the actions organized by EARLINET/ACTRIS (NRT delivery of the data and fast analysis of the data products) proved that aerosol lidars are useful for providing information not only for climatological purposes, but also in emergency situations [5].

References

[1] Pappalardo, G., Amodeo, A., Apituley, A., Comeron, A., Freudenthaler, V., Linné, H., Ansmann, A., Bösenberg, J., D'Amico, G., Mattis, I., Mona, L., Wandinger, U., Amiridis, V., Alados-Arboledas, L., Nicolae, D., and Wiegner, M., 2014. EARLINET: towards an advanced sustainable European aerosol lidar network, Atmospheric Measurement Techniques 7, 2389–2409.

[2] Ilić, L., Kuzmanoski M., Kolarž P., Nina A., Srećković V., Mijić Z., Bajčetić J., Andrić M., 2018. Changes of atmospheric properties over Belgrade, observed using remote sensing and in situ methods during the partial solar eclipse of 20 March 2015, Journal of Atmospheric and Solar-Terrestrial Physics171,250-259.

[3] D'Amico, G., Amodeo, A., Baars, H., Binietoglou, I., Freudenthaler, V., Mattis, I., Wandinger, U., and Pappalardo, G., 2015. EARLINET Single Calculus Chain – overview on methodology and strategy, Atmospheric Measurement Techniques 8, 4891-4916.

[4] D'Amico, G., Amodeo, A., Mattis, I., Freudenthaler, V., and Pappalardo, G., 2016. EARLINET Single Calculus Chaintechnical– Part 1: Pre-processing of raw lidar data, Atmospheric Measurement Techniques 9, 491-507.

[5] Papagiannopoulos, N., D'Amico, G., Gialitaki, A., Ajtai, N., Alados-Arboledas, L., Amodeo, A., Amiridis, V., Baars, H. et al., 2020. An EARLINET early warning system for atmospheric aerosol aviation hazards, Atmospheric Chemistry and Physics 20, 10775–10789.