ACTRIS efforts for Sentinel 5 Precursor validation

Lucia Mona¹, Nikolaos Papagiannopoulos¹, Gelsomina Pappalardo¹, Ulla Wandinger², Giuseppe D’Armino¹, Vassilis Amiridis³, Lucas-Alados Arboledas⁴, Doina Nicolae⁵, Arnoud Apituley⁶, Ewan O’Connor⁷, and Jana Pressler⁸

¹Institute of Methodologies for Environmental Analysis, National Research Council of Italy (IMAA-CNR), Potenza, Italy
²Leibniz Institute for Tropospheric Research, Leipzig, Germany
³National Observatory of Athens, Athens, Greece
⁴Andalusian Institute for Earth System Research, University of Granada, Granada, Spain
⁵National Institute of R&D for Optoelectronics, Bucharest, Romania
⁶Royal Netherlands Meteorological Institute, De Bilt, Netherlands
⁷Finnish Meteorological Institute, Helsinki, Finland
⁸National University of Ireland, Galway, Ireland

The Sentinel 5 Precursor products, call for an accurate validation. Europe can be nowadays regarded as a leader in ground-based vertical profiling observations. ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure Network) is an EC funded infrastructure integrating European ground-based stations equipped with advanced atmospheric equipment. Among these, EARLINET (European Aerosol Research Lidar NETwork) and Cloudnet are well-established networks providing vertical profiles of aerosol and clouds with high vertical and temporal resolution. A network of ground-based stations has the ability to provide the spatio-temporal development of aerosol and cloud fields and offers a unique opportunity for the validation of observations from space. In this project, state-of-the-art instrumentation for observing aerosol and clouds will be used for validation purposes: multi-wavelength lidar (EARLINET) and Doppler cloud radar (Cloudnet).

Characterization of aerosol and cloud fields over the stations is provided by the use of EARLINET and Cloudnet data. Additional information is provided by AERONET data where available. Differences will be reported as a function of aerosol load, aerosol and cloud height, aerosol type, cloud type and underneath surface.

First results of validation efforts performed within ACTRIS in terms of a quantitative evaluation of the accuracy of S5P aerosol and cloud products will be reported. This activity is done under the EC-ACTS: Earlinet and Cloudnet - Aerosol and Clouds Teams for Sentinel-5P Validation unfunded project, which comprises 3 EARLINET/Cloudnet stations [Potenza (IT), Leipzig (DE) and Cabauw (NL)]; 3 EARLINET stations [Granada (ES), Athens (GR) and Bucharest (RO)] and 2 Cloudnet sites [Mace Head (IE) and Sodankylä (FI)].

In particular, the first results will be about the SSP Aerosol Layer Height (mandatory product) and Aerosol Optical Depth (optional product) and whenever available the AAI-based columnar Aerosol
Type product.

