Geophysical Research Abstracts
Vol. 19, EGU2017-8835-1, 2017
EGU General Assembly 2017

Towards a first ground-based validation of aerosol optical depths from Sentinel-2 over the complex topography of the Alps

Valerio Marinelli (1), Edoardo Cremonese (2), Henri Diémoz (2), and Anna Maria Siani (1)

(1) Physics Department, La Sapienza University, Rome, Italy (valerio.marinelli@uniroma1.it), (2) Environmental Protection Agency of Aosta Valley (ARPA Valle d'Aosta), Saint-Christophe, Aosta, Italy

The European Space Agency (ESA) is spending notable effort to put in operation a new generation of advanced Earth-observation satellites, the Sentinel constellation. In particular, the Sentinel-2 host an instrumental payload mainly consisting in a MultiSpectral Instrument (MSI) imaging sensor, capable of acquiring high-resolution imagery of the Earth surface and atmospheric reflectance at selected spectral bands, hence providing complementary measurements to ground-based radiometric stations. The latter can provide reference data for validating the estimates from spaceborne instruments such as Sentinel-2A (operating since October 2015), whose aerosol optical thickness (AOT) values, can be obtained from correcting SWIR (2190 nm) reflectance with an improved dense dark vegetation (DDV) algorithm.
In the Northwestern European Alps (Saint-Christophe, 45.74°N, 7.36°E) a Prede POM-02 sun/sky aerosol photometer has been operating for several years within the EuroSkyRad network by the Environmental Protection Agency of Aosta Valley (ARPA Valle d'Aosta), gathering direct sun and diffuse sky radiance for retrieving columnar aerosol optical properties. This aerosol optical depth (AOD) dataset represents an optimal ground-truth for the corresponding Sentinel-2 estimates obtained with the Sen2cor processor in the challenging environment of the Alps (complex topography, snow-covered surfaces). We show the deviations between the two measurement series and propose some corrections to enhance the overall accuracy of satellite estimates.