



## **Multi-year measurements of columnar aerosol properties at an Alpine EuroSkyRad Station**

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A Prede POM-02 sun/sky aerosol photometer has been operating in the Saint-Christophe (Aosta Valley, Italy) site for almost 4 years, measuring sun irradiance and sky diffuse radiance for retrieving columnar aerosol optical properties. The peculiar position in an Alpine valley makes this site particularly significant for both assessing aerosols radiative impact on the high-sensitivity mountain climate and for tracing long-range transport of aerosol within the Mediterranean basin, acting as a background station. Indeed, limited local aerosol sources make this site particularly suitable to study air masses advections and interactions in such a complex environment. Complying with the EuroSkyRad network procedures, the SUNRAD.pack and SKYRAD.pack inversion algorithms have been used to determine aerosol parameters from direct and diffuse radiative fluxes, respectively. The resulting aerosol optical depth (AOD) and Ångström exponent values generally show very low mean AOD values, but with a large standard deviation due to periodical advection phenomena from natural (e.g. Saharan dust) and anthropogenic (polluted air from Po Valley) sources, as resulting from both specific aerosol optical properties and HYSPLIT backward trajectories analysis. A co-located optical particle sizer (OPS) and a lidar-ceilometer, allow to assess both the particle size distribution (PSD) at the surface and the vertical aerosol distribution for some of the most significant advection episodes carrying aerosols from external sources to the valley.