# Variation of the aerosols properties observed in the mixing layer and in the free troposphere from remote sensing and in-situ measurements performed at high altitude sites.

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Aerosols influence the Earth radiative budget through scattering and absorption of solar radiation which is significantly affected by the type of sources and ambient conditions. The aim of this study is to analyze the optical contribution of the mixing layer and free tropospheric aerosols to the total column.

The collocated sites of Puy de Dôme, France (PUY, 1465 m.a.s.l.) station and Cézeaux University Campus (CUC, 11 km to the East) allow to compare instrument retrievals and show an agreement between *in-situ* extinction coefficients and Sun photometer Aerosol Optical Depths (AOD) (correlation coefficient of 0.80). This first analyze permits to conclude that the PUY *in-situ* measurements station is representative of the overall atmospheric column.

In addition, the long term measurements performed at the Chacaltaya, Bolivia (CHC, 5240 m.a.s.l.) and PUY GAW stations permit to characterize seasonal variations and air mass type dependence of aerosol optical properties into both mixing layer (ML) and Free Tropospheric layers (FT). The two station situations allow to include in the study a large panel of aerosol origin.