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Operational detection of aerosols by the calibrated RAman LIDAR for Meteorological Observation (RALMO) and the CHM15K ceilometer at Payerne, Switzerland

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Ceilometers have become increasingly present across the globe at airports, national meteorological Services and research centers. More sophisticated LIDARs based on both elastic and inelastic scattering principles are currently available at several national research institutions and meteorological services. A growing need to optimize the generation of real-time data from these Automatic LIDARs and ceilometers (ALC) is also proven by new European programmes aiming at integrating a significant number of ALC instruments into large networks (e.g. E-PROFILE, http://www.eumetnet.eu/e-profile). The use of ALC instruments for operational detection of aerosols and clouds is submitted to their cost effectiveness as well as to the availability of scientific expertise for data monitoring and interpretation. Essential for data use and interpretation is the calibration procedure aimed to provide system-independent LIDAR products. An example of data calibration for backscatter and extinction coefficient measured with an automated RAman LIDAR (RALMO) and a CHM15K ceilometer will be presented. The temporal and vertical stability of the incomplete overlap correction function and of the Rayleigh calibration constant have been studied for both systems. Two cases of detection of long-range transported aerosol, from Canadian biomass burning and Saharan dust by the two calibrated systems will also be presented.