



## **Climatology of cloud (radiative) parameters at two stations in Switzerland using hemispherical sky-cameras**

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Our study analyses climatologies of cloud fraction, cloud type and cloud radiative effect depending on different parameters at two stations in Switzerland. The calculations have been performed for shortwave ( $0.3 - 3 \mu\text{m}$ ) and longwave ( $3 - 100 \mu\text{m}$ ) radiation separately. Information about fractional cloud coverage and cloud type is automatically retrieved from images taken by visible all-sky cameras at the two stations Payerne (490 m asl) and Davos (1594 m asl) using a cloud detection algorithm developed by PMOD/WRC (Wacker et al., 2015). Radiation data are retrieved from pyranometers and pyrgeometers, the cloud base height from a ceilometer and IWV data from GPS measurements.

Interestingly, Davos and Payerne show different trends in terms of cloud coverage and cloud fraction regarding seasonal variations. The absolute longwave cloud radiative effect (LCE) for low-level clouds and a cloud coverage of 8 octas has a median value between 61 and  $72 \text{ Wm}^{-2}$ . It is shown that the fractional cloud coverage, the cloud base height (CBH) and integrated water vapour (IWV) all have an influence on the magnitude of the LCE and will be illustrated with key examples. The relative values of the shortwave cloud radiative effect (SCE) for low-level clouds and a cloud coverage of 8 octas are between -88 to -62 %. The SCE is also influenced by the latter parameters, but also if the sun is covered or not by clouds. At both stations situations of shortwave radiation cloud enhancements have been observed and will be discussed.

Wacker S., J. Gröbner, C. Zysset, L. Diener, P. Tzoumanikas, A. Kazantzidis, L. Vuilleumier, R. Stöckli, S. Nyeki, and N. Kämpfer (2015) *Cloud observations in Switzerland using hemispherical sky cameras*, J. Geophys. Res. Atmos, 120, 695-707.