Geophysical Research Abstracts
Vol. 19, EGU2017-6032, 2017
EGU General Assembly 2017

Trend analysis of surface downward short and longwave radiation at four sites in Switzerland: Update for the 1996 – 2016 period

Stephan Nyeki (1), Julian Gröbner (1), Christine Aebi (1), Stefan Wacker (2), Laurent Vuilleumier (3), and Giovanni Martucci (3)

(1) PMOD/WRC, Davos Dorf, Switzerland (stephan.nyeki@pmodwrc.ch), (2) Asiaq, Greenland Survey, Nuuk, Greenland, (3) MeteoSwiss, Payerne, Switzerland

We present an updated trend analysis of downward short and longwave radiation (DSR, DLR) and aerosol optical depth (AOD) at four stations of the MeteoSwiss SACRaM (Swiss Alpine Climate Radiation Monitoring) network in Switzerland. The stations cover an altitude range between 370 and 3580 meters above sea level, and include Locarno, Payerne, Davos and Jungfraujoch. In a previous study, Wacker et al. (AIP Proc., 2013) observed positive trends for 1996 – 2010 in DSR but only Locarno was significant at the 95% confidence level. DLR trends remained flat. In addition, the net cloud radiative effect was found to decrease by up to 7.5 W m^{-2}, implying a reduction in fractional cloud cover. While the trend in AOD at the SACRaM stations was found to be negative for 1995 – 2005 (Ruckstuhl et al., JGR, 2008), a later study for the Davos and Jungfraujoch high-alpine stations for 1995 – 2010 (Nyeki et al., JGR, 2012) found no significant trends. In the present study, we will present updated and homogenised time-series of DSR, DLR, and AOD with respect to all-sky and clear-sky conditions for 1996 – 2016. Short and longwave clear-sky models will be used to explain and quantify the causes for any observed trends.