

Black Carbon measurements at different altitudes and boundary layer estimated by radiosonde, on a high-Arctic site (Ny-Ålesund, Svalbard), during 2011-2012.

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Effect of climate change on Arctic regions is a research topic of current interest. Light absorbing carbonaceous aerosols, are considered to be of importance as short-lived climate forcers. Hourly measurements of Black Carbon (BC) concentration, measured by an AE-31 aethalometer at the elevated Zeppelin (474 m asl) and by a Particle Soot Absorption Photometer (PSAP) at Gruvebadet (40 m asl) stations, are studied for one and a half year period. The height of the Planetary Boundary Layer (PBL) is estimated, for the same period, with the Liu and Liang method (Liu et al, 2010) from daily radiosonde data. The radiosondes are from Ny-Ålesund homogenized radiosonde record, available from Maturilli et al, 2016. The correlation of the time-series is examined for different seasons, within the context of the relative position of the stations to the PBL height. This methodology investigates the possibility of assessing simultaneous BC measurements from the lower and the free troposphere. Overall, low PBL instances correspond to high BC concentrations mainly at Zeppelin, while high PBL levels capture a stronger relation to low BC concentrations at Gruvebadet.