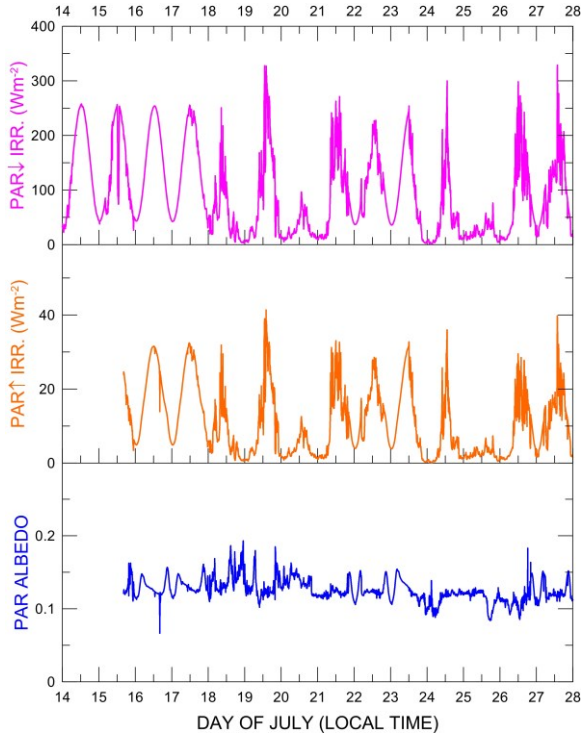
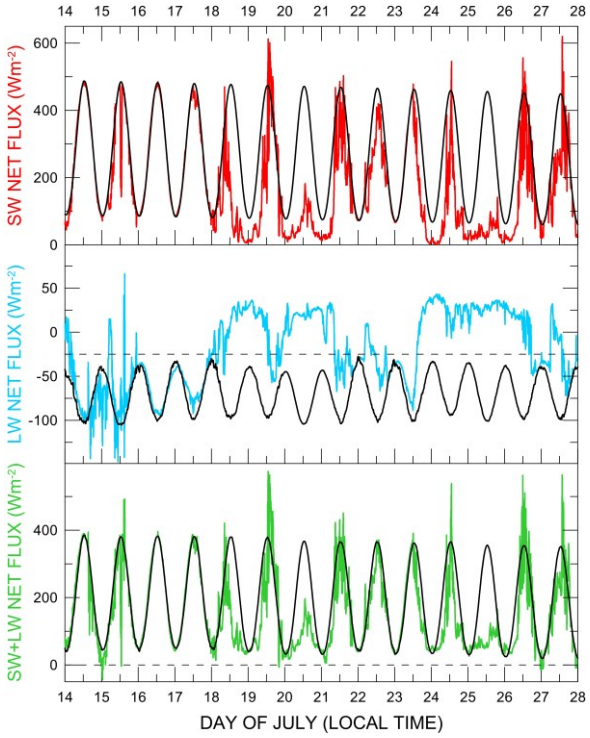
solar/infrared radiation radiometers

Two sets of three broadband radiometers, respectively for solar, infrared, and photosynthetic radiation, are installed on the roof (for the downward component) and on a mast (for the upward component) to measure the radiation budget at the surface and the surface albedo. Measurements of downwelling solar radiation were started by the Danish Meteorological Institute. ENEA is presently running the broadband radiation measurements carried out at THAOO.

Various types of broad band radiometers are used: pyranometers for solar (shortwave, SW) radiation, pyrgeometers for infrared (longwave, LW) radiation, and PAR sensors for photosynthetically active radiation. All radiometers are routinely calibrated and referred to the World Meteorological Organization World Radiation Reference scale to guarantee global comparability. These measurements allow to investigate climate processes in the Arctic and the radiative effect of different atmospheric compounds (clouds, water vapor, aerosol).





Left: time series of downward and upward PAR irradiance and derived surface albedo during the July 2016 SVAAP campaign; right: time series of the SW, LW, and total (SW+LW) surface net fluxes derived from measurements and for cloud-free conditions (black curves). The difference between measured and cloud-free curves is the radiative effect produced by clouds.

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