



Project acronym: TUPILAQ

Project title: Triple UP-scaling of Ice-Light-Absorbing particles at Qaanaaq ice cap

Project leader: Giacomo Traversa, Italian National Research Council, Italy

Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): The DMI Geophysical Observatory Qaanaaq (Greenland/Denmark)

The Triple UP-scaling of Ice-Light-Absorbing particles at Qaanaaq ice cap – TUPILAQ project aims to better understand the role of light absorbing particles (LAPs, e.g., phototroph blooms, cryoconite, dust) over ice surfaces at Qaanaaq Ice Cap. We further aim at providing a method to analyse this phenomenon using remote sensing (both multispectral and hyperspectral imagery) by means of a triple up-scaling process (i.e., spatial, temporal and spectral). The field activities will be carried out in late boreal summer, once most of the snow at the surface has melted away, and bare ice is accessible. The study site is the Qaanaaq Glacier (about 2.5 km away from the DMI Geophysical Observatory) where previous studies have identified the presence of several phototroph blooms and cryoconite. The field data acquisition consists in transects of spectral reflectance using a Visible-Near Infrared (400-850nm) spectrometer (JB Reflectance Box, RoX), along the study area to obtain a good spatial distribution of ice reflectance and albedo to be subsequently compared with satellite data. Additionally, some necessary surface ice samples will be collected, to determine LAP concentration. In addition, when possible, also UAV surveys would be considered in order to provide useful DEMs and orthophotos of certain areas of the glacier, which would allow a high-resolution analysis of distribution of impurities.