Dataset name: **iCUPE Dataset (DS) from Deliverable 1.1.3:**

DS on snow spectral reflectance measurements at Ny-Ålesund, Svalbard

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The produced dataset (in csv format) contains snow spectral albedo as measured the field activity carried out in Ny-Ålesund (Svalbard Islands, Norway), where an unmanned apparatus was installed to provide continuous observations during spring-summer period of 2014 at the CNR Climate Change Tower, with the aim to deeply investigate changes in radiative characteristics during snow melting process.

The survey covered the period from 25th May to 9th July 2014, when weather was highly variable and the sun is constantly above the horizon. The continuous monitoring of the spectral albedo of the snowed surface was obtained coupling a tilting system with an ASD FieldSpec 3 portable spectroradiometer. The system was installed during the boreal spring nearly 8 m above the ground. The foreoptic applied to the fiber was a Remote Cosine Receiver (RCR) with a hemispheric field of view that was fixed on the tilting device. The collected radiant energy was detected by 3 spectroradiometers included in the Fieldspec with a wavelength range comprised between 350 and 2500 nm with a maximum spectral resolution of 1 nm. The spectral albedo measurements were acquired using the standard RCR mounted on the tilting system. Measurement cycles were performed every 15 min. Dark

and optimization operations were executed every hours to estimate gain and spectral offset for each radiometer. Each rotation cycle is composed by a sequence of 6 down-welling irradiance spectra performed before and after 3 upwelling measurements, by completing the whole sequence in less than 3 min. All the stored spectra result from the average of 10 fast acquisitions. Standard deviation associated to each triplet of spectra, provided information on sky stability, and hence, indicating the possibility to perform accurate determination of the spectral albedo. For more details on experimental setup, acquisition and analysis procedures, see Salzano et al. (2016).

Dataset includes 1728 spectra of snow albedo with a resolution of 1 nm from 350 nm to 2500 nm. These are stored in a unique file that contains columns of collected measurements in the following order:

row 1	wavelength channels (w_350, w_351, ..., w_2500)
row 2	time
column 1	spectra number (albedo, alb, alb.1.....alb.1726)
column 2	snow spectral albedo at 350 nm
...	
column 2501	snow spectral albedo at 2500 nm
column 2502	date time (AAAA-MM-DD HH:MM) in UTC

where: AAAA – year, MM – month, DD – day, HH – hour, MM – minute,
UTC – Universal Coordinated Time

Note, there are gaps/ holes (i.e. no data) in measurements mainly due to instruments' failures.

The dataset is accessible at:
http://doi.org/10.5281/zenodo.3965461

References:

Salzano R., Lanconelli C., Salvatori R., Esposito G., Vitale V. (2016), Continuous monitoring of spectral albedo of snowed surfaces in Ny-Alesund, Rend. Fis. Acc. Lincei, 27 (Suppl 1):S137–S146 doi: 10.1007/s12210-016-0513-y