

SISpec 2.0 Snow-Ice Spectral Library

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The snow-ice spectral albedo is certainly one of the most important indicators to efficiently derive snow cover information from remote sensors. Spectroradiometric measurements of snow surface acquired on field, coupled with snow data such as shape and size of snow grains were organized in a spectral library (SISpec), aiming at becoming an efficient tool for image processing. The SISpec library will be available and searchable online soon.

SISpec

The SISpec spectral library contains snow and ice spectral signatures collected during field campaigns both in Antarctica and Arctic regions. Absolute spectral reflectance curves in the wavelength range between 350 and 2500 nm were obtained with a portable spectroradiometer, the Fieldspec FR (from Analytical Spectral Device Inc. Boulder, CO, USA), as a ratio between the radiation reflected from the measured surface and the radiation reflected by a white Spectralon panel.

Measurement sites were selected paying particular attention to the different types of snow surface characteristics (metamorphism) and taking into account the local weather conditions. In each Polar region, sites on smooth surfaces, open enough to be recognized and sampled even at the spatial resolution of satellite images (considering a 30x30 pixel area of 3x3 pixels approximately 100x100 meters) have been selected.

The nivological data relating to the surfaces examined were associated with each spectral curve, such as the shape and size of the grains, density, hardness, and snow temperature. The adopted standard for the description of the characteristics of the snow cover is the International classification for seasonal snow on the ground (2009 IASC).

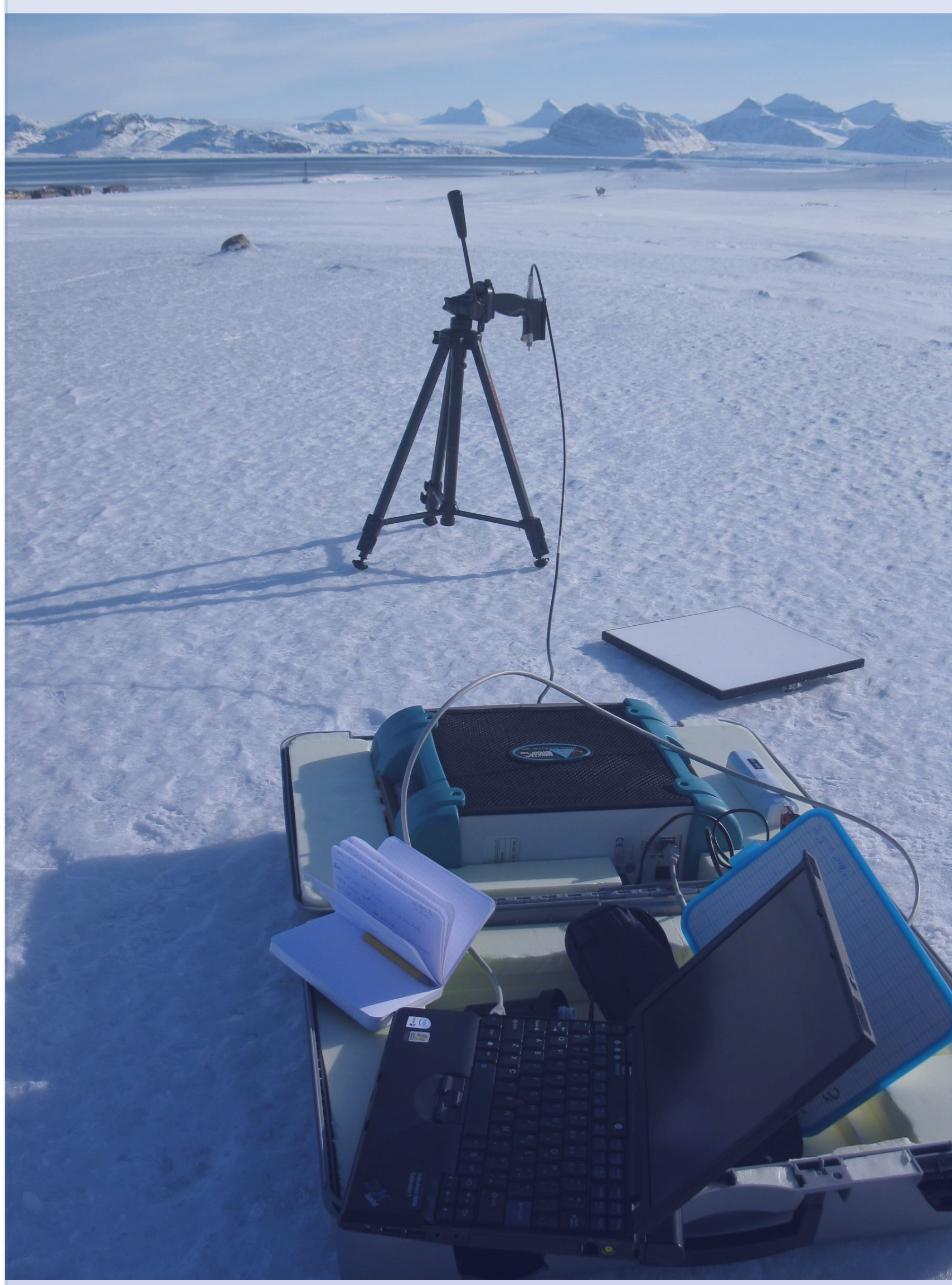
Metadata

The SISpec data are associated to a set of customised metadata designed to accurately describe the data in the library: spectral signature, nivological parameters (shape and size of the grains, density, hardness, and snow temperature), meteorological data.

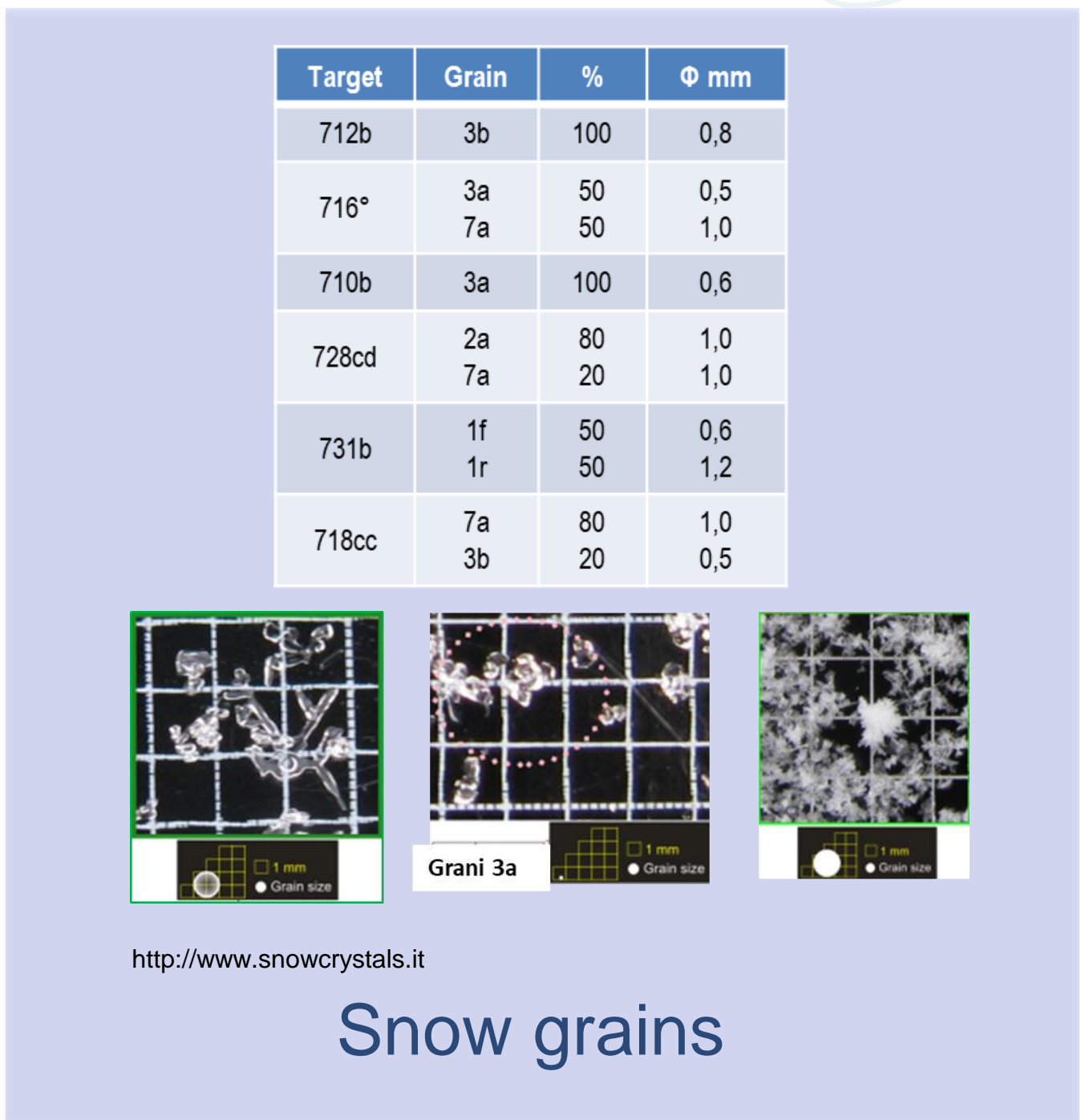
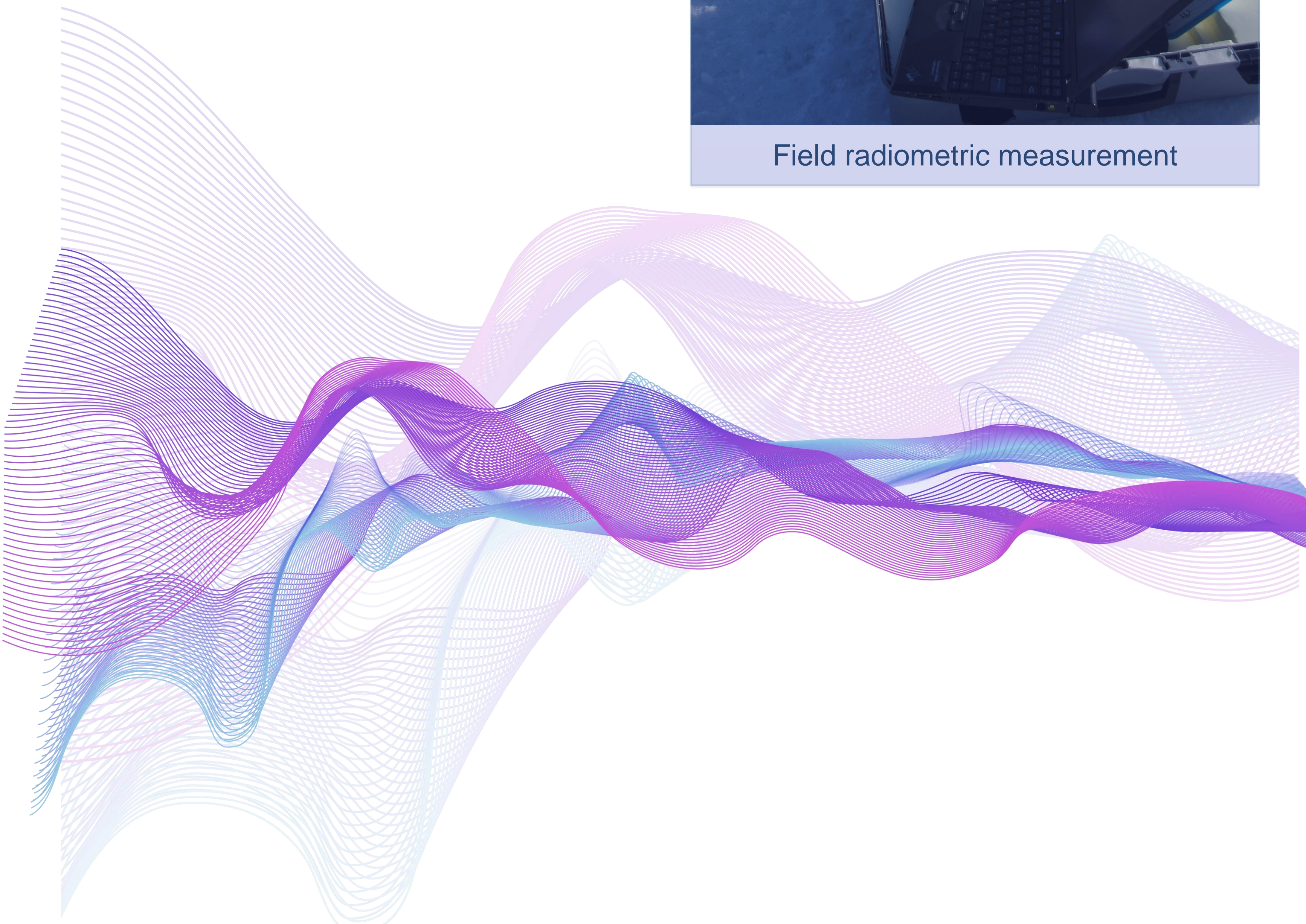
The set of metadata has been chosen following the ISO 19115-1:2014, other shared metadata standards (es. Dublin Core) and the netCDF climate forecast (CF) metadata conventions. They comprise both administrative and descriptive metadata.

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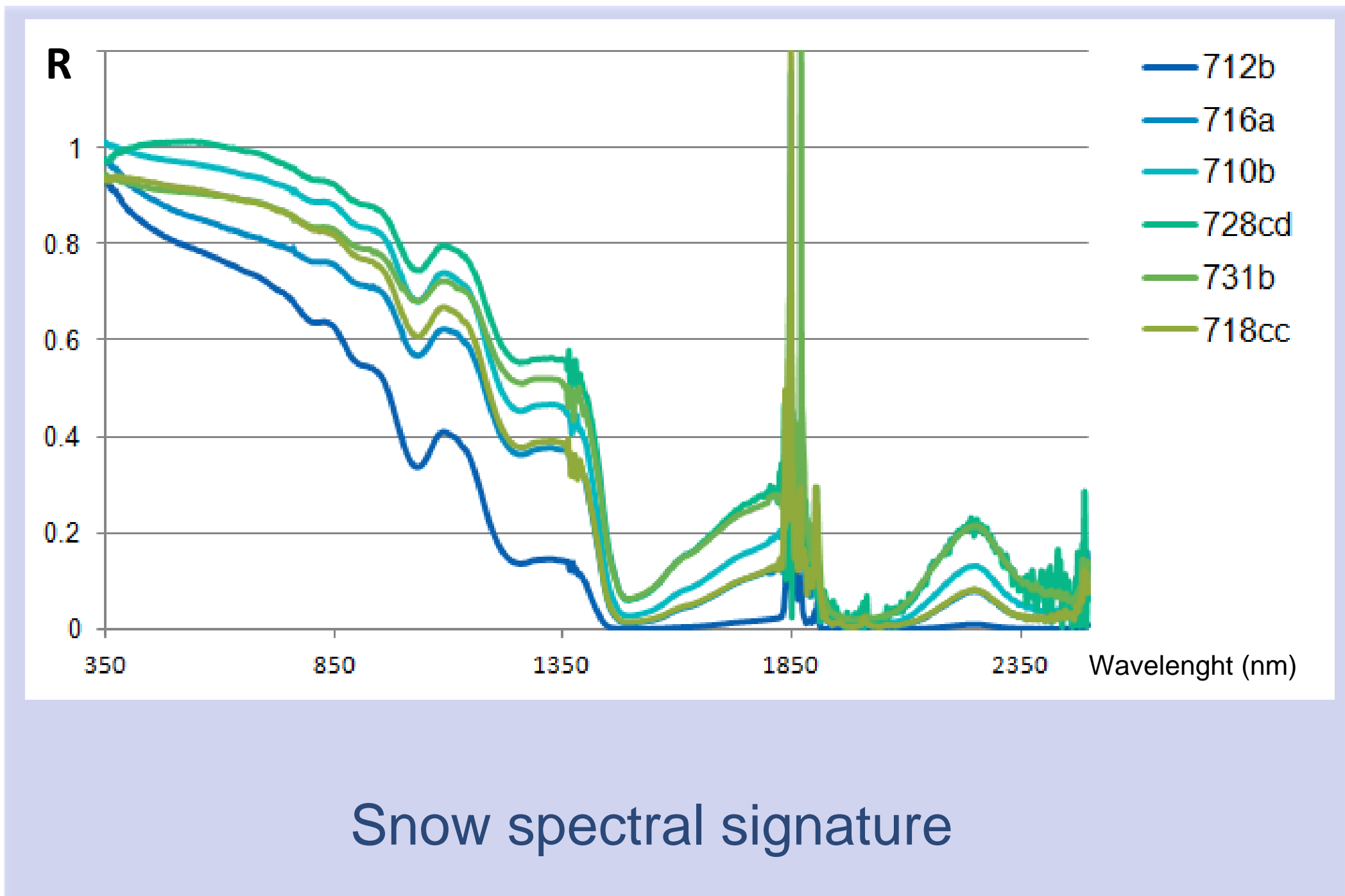
Metadata will ensure a correct organization, discovery and retrieval information and query the database.



Field radiometric measurement



Snow grains



Snow spectral signature

| General | Geo-meteo | Surface & Snow |
|----------------------|--------------------|--------------------------|
| key | area_code | surface_type_code |
| title | site_descr | surface_type_code method |
| resource type | XUTM | description |
| dataset description | YUTM | photo_file-target |
| resource status | epsg | photo_file- area |
| reference date | date- ora | snowdepth_cm |
| temporal extension | formato data ora | snow grain form |
| custodian | elevation asl | snow grain form method |
| authors/contributors | T_ air | percent |
| use constraints | cloud cover | diameter_mm |
| attribution | cloud cover method | form2 snow |
| contacts | wind | percent2 |
| organisation | wind method | diameter2_mm |
| keywords | | form3snow |
| language | | percent3 |
| | | diameter3_mm |
| | | hardness_code |
| | | hardness_code method |
| | | T_ snow |
| | | T_ Snow method |
| | | humidity_code |
| | | humidity_code method |
| | | density |
| | | density method |
| | | rough_code |
| | | rough_code method |
| | | rough_l cm |
| | | rough_d cm |

Metadata

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