



Airborne BB and UV albedo of Arctic snow and snow-covered trees

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The SNORTEX campaign was carried out in Sodankylä, Finnish Lapland in 2008-2010. The key objectives were: 1) to better characterize the snow-melting patterns at a landscape scale using a multi-scale strategy supported by multi-angular and multi-spectral remote sensing information; 2) to provide solid database information for the validation of the SAF (Satellite Application Facilities) snow-related products (albedo, fraction, water equivalence). In situ measurements of snow depth, density and water equivalent were carried out both in mid-winter and melting conditions. The data set consists of more than 250 snow pit measurements including also temperature and humidity profiles.

In 2008 the measurements were carried out within an area of a diameter of about 50 km to assess the spatial variation of the snow characteristics. Land cover classes varied from open fields, mires and frozen lakes to forests. In 2009 and 2010 the intensive test area was 10 km in diameter, but additional snow depth, snow density and snow water equivalent values were measured in the larger area of 2008. Helicopter based measurements were carried out using four broadband (pyranometers) and four UV sensors (SL501) besides a wide optics camera, a humidity sensor (Humicap) and thermometer (Pt100). The UV and broadband sensors were attached on either side of the helicopter, one looking upwards and the other downwards in order to always have one sensor pair of each kind unshaded. The sensors were at the same level close to each other, so that their viewing configuration was the same. Broadband mast measurements were used for calibrating the configuration. The wide optics camera was used for leaf area index retrieval simultaneously with the radiation measurements.

Data was gathered both in completely clear sky and completely overcast situations. The flight scheme varied from long distance flights at various altitudes to vertical profiles. Typically good correlation was found for the broadband and UV albedo values ($R^2 > 0.8$).