PROJECT SUMMARY REPORT - 2016 SERF CAMPAIGN

Subproject: Measurement of bidirectional reflectance distribution function of sea ice using a Gonio-Radiometric Spectrometer System (GRASS)

Actual field dates: February 15 – 28, 2016
Field site: Sea-ice Environmental Research Facility (SERF), University of Manitoba, Winnipeg (Canada)
Number of man-days in the field: 22

Summary:

In February 2016, our team undertook multi-angular reflectance measurements of bare and snow-covered sea ice at the Sea ice Environmental Research Facility (SERF) at University of Manitoba, during the second phase of the facility's 2016 program. After setting up the Gonio-Radiometric Spectrometer System (GRASS) and conducting initial tests, we were able to perform measurements over 6 days, capturing a variety of sea ice conditions, from snow covered to melting. The team from University of Manitoba provided us with ancillary data during the whole duration of the campaign (thickness, air temperature, chl a concentrations…). Owing to the weather conditions, the thickness of the sea ice did not vary significantly. Therefore, the main results obtained during the campaign were the angular hyperspectral reflectance as a function of solar zenith angle and the effects of a thin snow layer on the reflectance of sea ice. An ASD FieldSpec spectroradiometer provided calibrated irradiance and radiance measurements for the validation of the results obtained with GRASS.

Although the meteorological conditions were not ideal, we obtained novel data that will be used as input parameters for a radiative-transfer model developed in collaboration with Royal Holloway University of London (RHUL). Furthermore, SERF provided us with an excellent validation tool for the validation of optical satellite sensor calibration parameters, developed at the National Physical Laboratory (NPL) and RHUL.

Photos:

Fig.1: GRASS instrument measuring the multi-angular reflectance of sea ice at SERF. Credit: Maxim Lamare
Fig. 2: HDRF of snow on sea ice after a 2cm snowfall during the night. Credit: Maxim Lamare
Fig. 3: Manually rotating the instrument. Unfortunately the structure is not motorized! Credit: Federico Di Paolo
Fig.4: Measuring the reflectance o open water. Credit. Claire Greenwell

Participants:

Maxim Lamare, Royal Holloway University of London (UK) ; Claire Greenwell, National Physical Laboratory (UK)

Figure 1

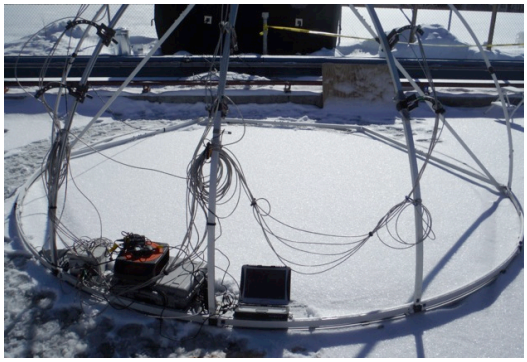

Figure 2

Figure 3

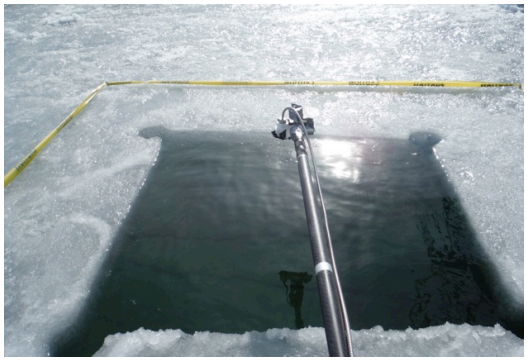

Figure 4

Acknowledgements:
Maxim Lamare and Martin King would like to thank NERC for support under Grant NE/K000770X/1 and NERC FSF (555.0608) for the equipment loan. Claire Greenwell and Maxim Lamare thank NPL for financial support, without which the field campaign would have not been possible. They also thank the team at University of Manitoba for their support.

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