



INTERNATIONAL ICE CHARTING WORKING GROUP (IICWG)

Task Team 1

ROSE-L

Most Recent Update: 9 May 2021

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Task Objectives:

- Investigate the advantages of using combinations of C- and L-band images for operational ice charting in support of the advisory group for ESA's HPCM ROSE-L (Radar Observing System for Europe at L-band).
- Acquire ALOS-2 PALSAR-2 and SAOCOM L-band images; Sentinel-1 and Radarsat-2 C-band images over the same area with the shortest possible time difference.
- Different ice centers and ice analysts will utilize C- and L- images for producing examples of ice charts.

Status:

- ESA supports the ROSE-L task team with €200K for over 18 months. The project has started on June 1st, 2020 with a literature survey, which was finished in mid-January with a detailed report. A short summary was submitted as contribution to the IGARSS symposium to a special session on the synergies between L- and C-band SAR for different applications, [and the project was introduced at the EGU in May](#).
- JAXA has acquired a large number of ALOS-2 PALSAR-2 over our Arctic test sites (Baffin Bay, Belgica Bank, Fram Strait, Labrador Sea, South Greenland), and additionally we obtained scenes from North Greenland Sea ice regions. Between April 2019 [and April 2021](#), 543 scenes were acquired in total over the test sites. [A central archive is implemented at the University in Tromsø](#), single operational centers have their own archives for the test sites they are interested in. PALSAR-2 images have also been acquired over the Baltic. In addition, TerraSAR-X and COSMOS SkyMED images have been gathered over different test sites with as small time gaps to PALSAR-2 acquisitions as possible.



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- ESA has made available the airborne F-SAR X-, C-, and L-band images that were acquired by DLR over Davis Strait in April 2019. Wolfgang carried out a first comparison between the different radar bands and photographs that were taken during the flights, considering also weather reports and ice charts provided by CIS.
- In November 2020, discussions took place between members of the “SH branch” of task 1, also including some of the NH team members, about possible strategies and test sites for the use and evaluation of multi-frequency SAR data over sea ice regions on the SH.
- Based on this discussion, a letter was sent to CONAE to formalize access to SAOCOM L-band imagery.
- PALSAR-2 images were acquired over the southern part of Baffin Bay and the Labrador Sea during a period of a heavy storm. Mike Hicks from the IIP ordered Radarsat-2 Wide-Fine and Sentinel-1 EWS imagery. The data, however, have not been analyzed yet since access to the images has been only possible since May.
- Together with colleagues from Chalmers University of Technology in Sweden, Wolfgang is working on the second report for the ESA project, dealing with the description of typical ice conditions at the test sites, methods for estimating ice drift and deformation from SAR image pairs, and the design of a method for alignment of C- and L-band images for automated joint analysis (for which the drift and deformation retrieval is important).
- Until now, no further action took place regarding the SH-branch.

Next Steps:

- In the framework of the ESA project, a method for matching of L- and C-band images acquired with a time gap needs to be devised and tested.
- The storm event in the Labrador Sea and its impact on iceberg detection has to be analyzed.
- Investigations of the F-SAR data set have to be continued (which is also part of the ESA study). At present, they are of lower priority.
- Alvaro, Constanza and Wolfgang need to take action as soon as possible: Identify Southern Ocean test sites and apply for data acquisitions over them.

Estimated Percent Complete: 50% (considering SH-activities)

Interaction with Other Task Teams:

Exchange of information with Task Team 13 (Ice Model Case Studies) and Task Team 14 (SOLOKI) is valuable, as well as with Task Teams 15 & 16 (Hazard products sea ice and icebergs). The latter has not been implemented yet.

What is working well?

The topic is focused on a well-defined objective, the team members are directly involved in the project because they are interested in achieving results from which they will benefit in the future. Collaboration of IICWG with ESA and CIRFA/UiT.



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Are there barriers hindering progress?

The time required to work on the task is limited, which is slowing down progress. Bureaucracy and administration.

SHNA is having some limitations with computing capacities, as they need to upgrade their hardware and have no funding for this. Alvaro and Constanza will be on icebreaker in Antarctic from November until March which may make coordination with CONAE more difficult.