



Sea ice concentration and sea ice drift for the Arctic summer using C- and L-band SAR

Malin Johansson, Anders Berg, and Leif Eriksson

Department of Earth and Space Sciences, Chalmers University of Technology, Gothenburg, Sweden
(malin.johansson@chalmers.se)

The decreasing amount of sea ice and changes from multi-year ice to first year ice within the Arctic Ocean opens up for increased maritime activities. These activities include transportation, fishing and tourism. One of the major threats for the shipping is the presence of sea ice. Should an oil spill occur, the search and rescue is heavily dependent on constant updates of sea ice movements, both to enable a safer working environment and to potentially prevent the oil from reaching the sea ice. It is therefore necessary to have accurate and updated sea ice charts for the Arctic Ocean during the entire year.

During the melt season that ice is subject to melting conditions making satellite observations of sea ice more difficult. This period coincides with the peak in marine shipping activities and therefore requires highly accurate sea ice concentration estimates. Synthetic Aperture Radar (SAR) are not hindered by clouds and do not require daylight. The continuous record and high temporal resolution makes C-band data preferable as input data for operational sea ice mapping. However, with C-band SAR it is sometimes difficult to distinguish between a wet sea ice surface and surrounding open water.

L-band SAR has a larger penetration depth and has been shown to be less sensitive to less sensitive than C-band to the melt season. Inclusion of L-band data into sea chart estimates during the melt season in particular could therefore improve sea ice monitoring. We compare sea ice concentration melt season observations using Advanced Land Observing Satellite (ALOS) L-band images with Envisat ASAR C-band images. We evaluate if L-band images can be used to improve separation of wet surface ice from open water and compare with results for C-band.