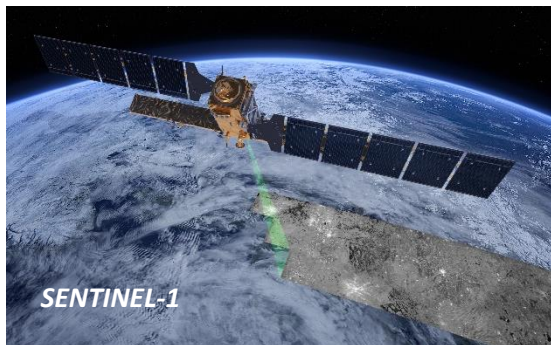


Satellite synthetic aperture radar for sea ice type discrimination



Background

Arctic sea ice extent is a sensitive climate indicator. Due to global warming, sea ice is declining in the past few decades. The melting ice leads to the opening of northern sea routes in the Arctic Ocean as alternative routes for transporting cargoes between Far East Asia and Europe. To navigate safely along the northern sea routes, it is important to have accurate weather forecast and ice observations.

Microwave satellite sensors can observe the Earth day-and-night, regardless of the weather conditions. Among them, synthetic aperture radar (SAR) provides the finest spatial resolution.

The project

For ship navigation near the ice edge, it is crucial to distinguish thick multiyear ice (MYI) from other sea ice types. Theoretically, sea ice types can be discriminated with different backscatter signatures from SAR. However, the discrimination is hampered by ambiguities in the relation between ice types and backscatter.

The goal of this master project is to implement a supervised statistical classification algorithm for identifying ice types from Sentinel-1 (C-band SAR) and use the results to evaluate the existing sea ice type products from passive and active microwave sensors.

It will be a perfect project for students who want to get into radar remote sensing applications.

Prerequisites

Programming skills are required (Python or MATLAB). A broad interest in image processing is preferable.

Supervisors

Leif Eriksson (leif.eriksson@chalmers.se), Department of Space, Earth and Environment

Yufang Ye (yufang.ye@chalmers.se), Department of Space, Earth and Environment