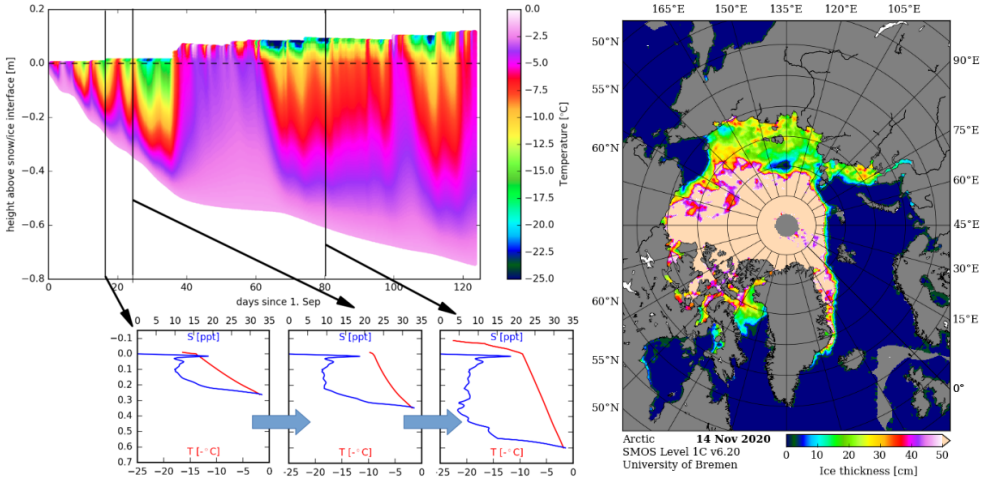
Master Thesis

Modelling and Retrieval of Sea Ice Thickness from Microwave Radiometer Satellite Observations



Left: Sea ice growth end temperature evolution within a season of ice growth, Right: Thin ice thickness product from SMOS satellite observations.

The IUP has a longstanding history in retrieving sea ice and atmospheric properties from satellite observations. Within the research group for Remote Sensing of Polar Regions (www.seaice.uni-bremen.de/research-group/) new methods for satellite remote sensing of sea ice and the atmosphere above are developed and interpreted in a climate system context.

Sea ice in the Arctic and Antarctic regions act as an insulator between ocean and atmosphere. Thus, the thickness of sea ice is of major importance for climate modelling and prediction. There are established methods of deriving sea ice thickness from satellite observations, but all these methods are based on a limited set of training and validation data. Since more than 10 years the SMOS satellite measures the emitted radiation from the Earth's surface at a frequency of 1.4 GHz, which can be related to the thickness of thin sea ice (up to approx. 50 cm).

In this this study modelled sea ice thickness will be combined with actual satellite measurements on a statistical basis to improve current products of thin ice thickness.

What you need and what you will learn

You will need physics knowledge and some computer programming experience will be of advantage. Interest in numerical problem solving, statistical methods, and machine learning will be helpful.

You will learn about sea ice modelling and satellite retrieval methods. Also, handling and automatic processing of large satellite data sets will play a role.

Our working group offers an open discussion atmosphere and worldwide contacts to the leading institutions in the field.

Contact

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Earliest start date is June 2021.