

On level ice thickness retrieval in the Kara Sea using MODIS and ENVISAT ASAR data and thermodynamic modeling

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Our target is to estimate level ice thickness (less than 1 m) in the Kara Sea based on the MODIS thermal infrared and ENVISAT ASAR Wide Swath Mode data, and on the use of an 1-D high-resolution thermodynamic snow/ice model (HIGHTSI). In the study the method is tested during the winter season of Dec 2008 – Apr 2009. The suggested approach works under cold winter conditions in first-year ice zones. The work is a part of an ongoing research project where the possibility to produce regularly an ice thickness map over the Kara Sea is investigated.

We will discuss several aspects related to the retrieval problem: the accuracy of forcing data (HIRLAM) and its impact on the retrieval results, how to take into account the snow cover, the SAR signature and sea ice deformation. Because the coverage of MODIS thermal data is severely limited due the cloudiness, we will outline how the estimated SAR/MODIS based ice thickness chart can be extrapolated into cloud covered areas.